

TC-209SD

REVISED

AEP Model
UK Model



STEREO CASSETTE-CORDER

SPECIFICATIONS

Power requirements:	AC 110, 127, 220, 240 V, 50 Hz	Wow and flutter:	0.07 % WRMS (NAB) ±0.18 % (DIN)
Power consumption:	38 W	Inputs:	MIC (phone jack) 2 sensitivity: -72 dB (0.2 mV) for low-impedance microphone
Tape speed:	4.8 cm/s (1 7/8 ips)		LINE IN
Fast forward and rewind time:	Approx. 70 seconds (by C-60)		phono jack 2
Track system:	4-track 2-channel stereo		stereo binaural jack 1
Record bias frequency:	105 kHz		sensitivity: -22 dB (60 mV)
Signal-to-Noise ratio:	DOLBY NR* OFF With Ferri-Chrome Cassette 61 dB at peak level (NAB) 53 dB (DIN) With chromium dioxide cassette 57 dB at peak level (NAB) 48 dB (DIN) With regular cassette 55 dB at peak level (NAB) 46 dB (DIN) DOLBY NR* ON Improved 5 dB at 1 kHz, 10 dB above 5 kHz		input impedance: 100 kΩ
		Outputs:	LINE OUT (phono jack) 2 output level: 0 dB (0.775 V) at load impedance 100 kΩ LINE OUT level control at "10" load impedance: more than 10 kΩ
Total harmonic distorsion:	1.7 %		HEADPHONES 1 load impedance: 8 Ω
Frequency response:	DOLBY NR* OFF With Ferri-Chrome Cassette and chromium dioxide cassette 20-18,000 Hz (NAB) 30-15,000 Hz ±3 dB (NAB) 30-16,000 Hz (DIN) With regular cassette 20-15,000 Hz (NAB) 30-13,000 Hz (DIN)	Record/playback jack:	Input impedance less than 10 kΩ Output impedance less than 10 kΩ
		Record/playback head:	PF145-3602
		Erase head:	EF135-36
		Motor:	HC-526L
		Semiconductors:	2 ICs, 2 FETs, 48 transistors, 42 diodes, 1 LED
		Dimensions:	Approx. 430 (w) x 170 (h) x 320 (d) mm 17(w) x 6 3/4 (h) x 12 5/8 (d) inches Including projecting parts and controls
		Weight:	Approx. 12 kg, 26 lb 8 oz

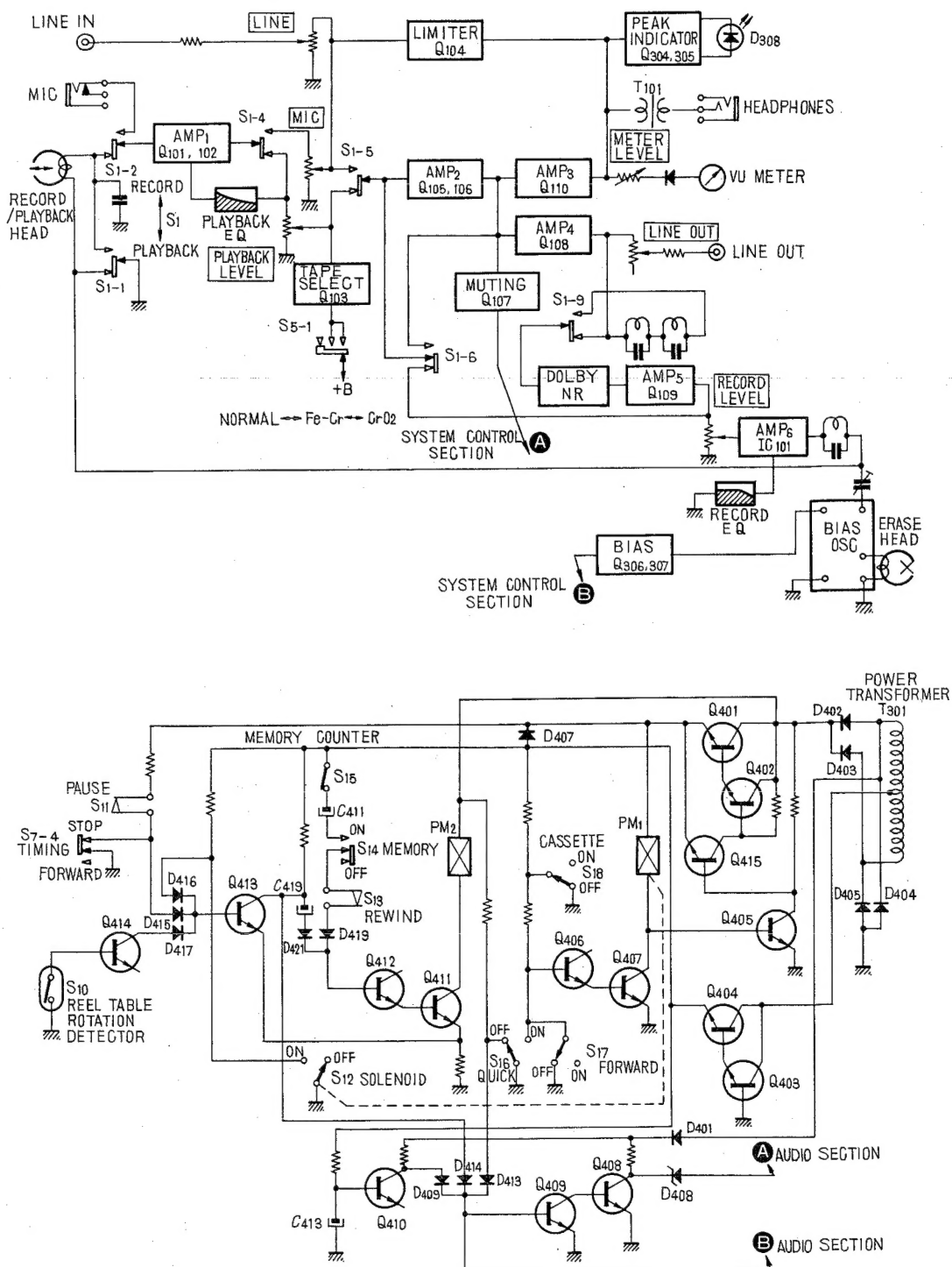
* The word Dolby is a trademark of
Dolby Laboratories, Inc.

SONY®

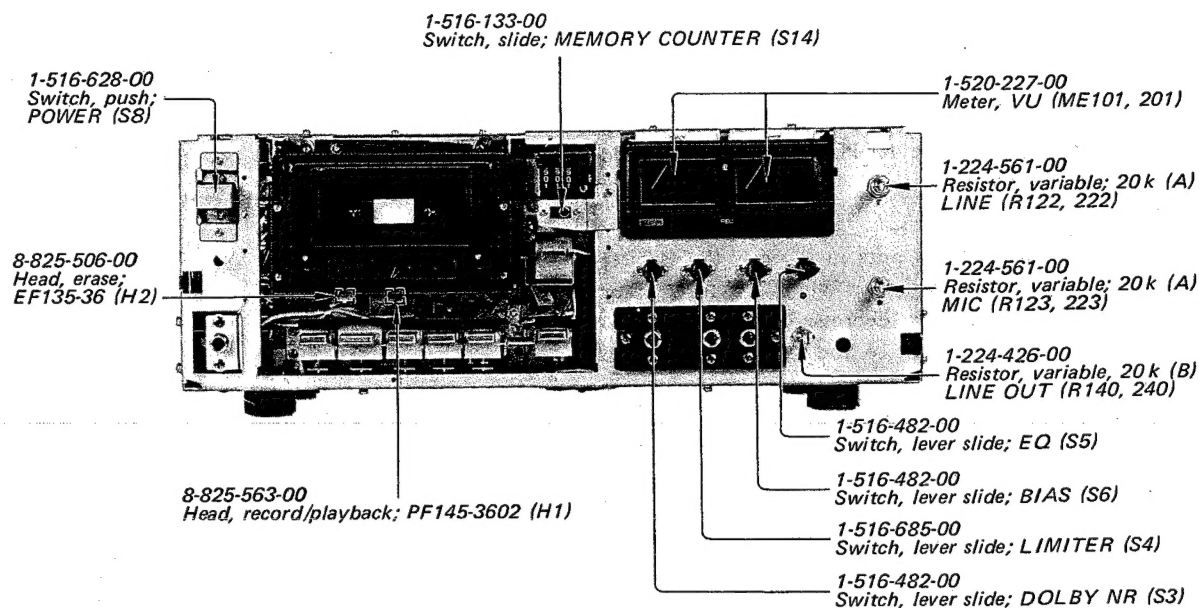
SERVICE MANUAL

SECTION 1 OUTLINE

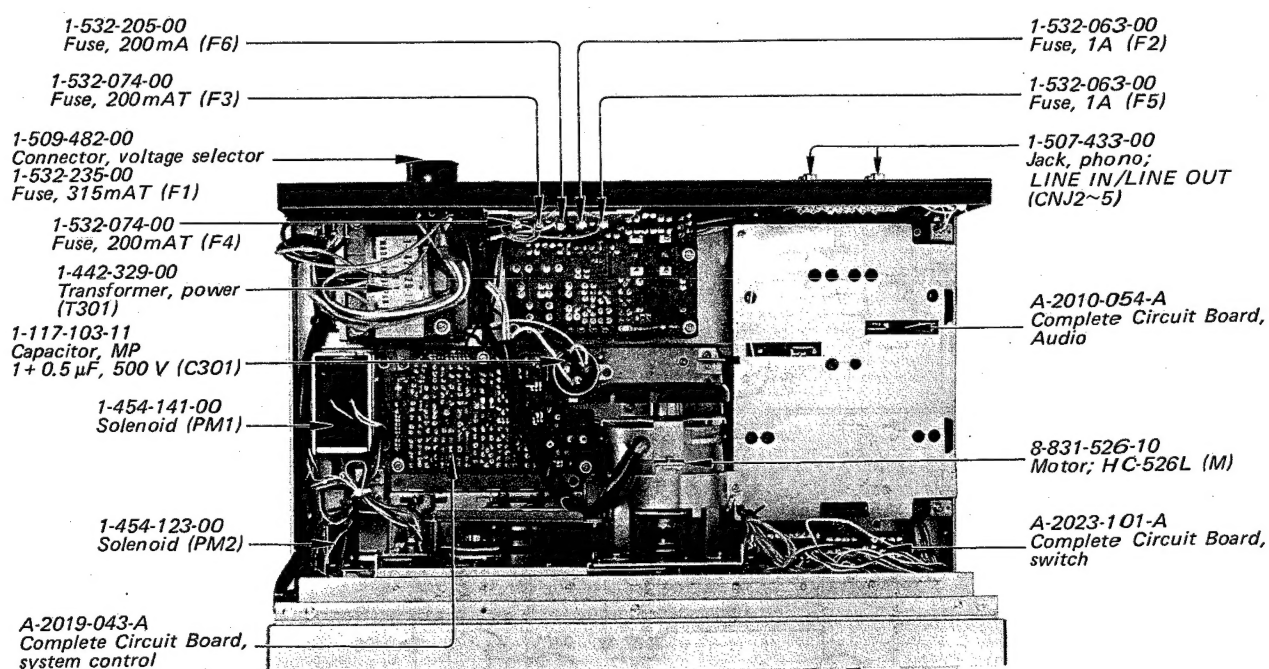
1-1. BLOCK DIAGRAM



1-2. INTERNAL VIEW (1)



1-3. INTERNAL VIEW (2)



1-4. CIRCUIT DESCRIPTION

1. Muting Function at Power ON
(Routes ①, ② and ③):

Q410 and Q408 are in off state and Q409 is in ON state until C413 connected to the base of Q410 charges up. The muting voltage is applied to the muting circuit through D408.

2. From Stop Mode to Playback, Fast Forward or Rewind Mode
(Routes ④ and ⑤):

If a tape cassette puts in the set, the cassette switch S18 turns ON. When the forward or rewind button is depressed, the quick and forward switches (S16 and S17) turn ON (S16 turns OFF immediately) and Q406 and Q407 turn ON. Accordingly, the function solenoid PM1 turns ON.

Routes ⑧, ⑨, ⑩ and ⑰:

When Q406 and Q407 turned ON, the base potential of Q403 becomes zero and Q403 turns OFF. Thus Q415 turns ON and the emitter of Q401 and the base of Q402 are in the short-circuit condition. Namely, Q402 turns OFF and Q401 becomes open. In this condition, B1 + voltage disappears. However, the function solenoid PM1 keeps the ON condition by taking B2 + voltage through D407.

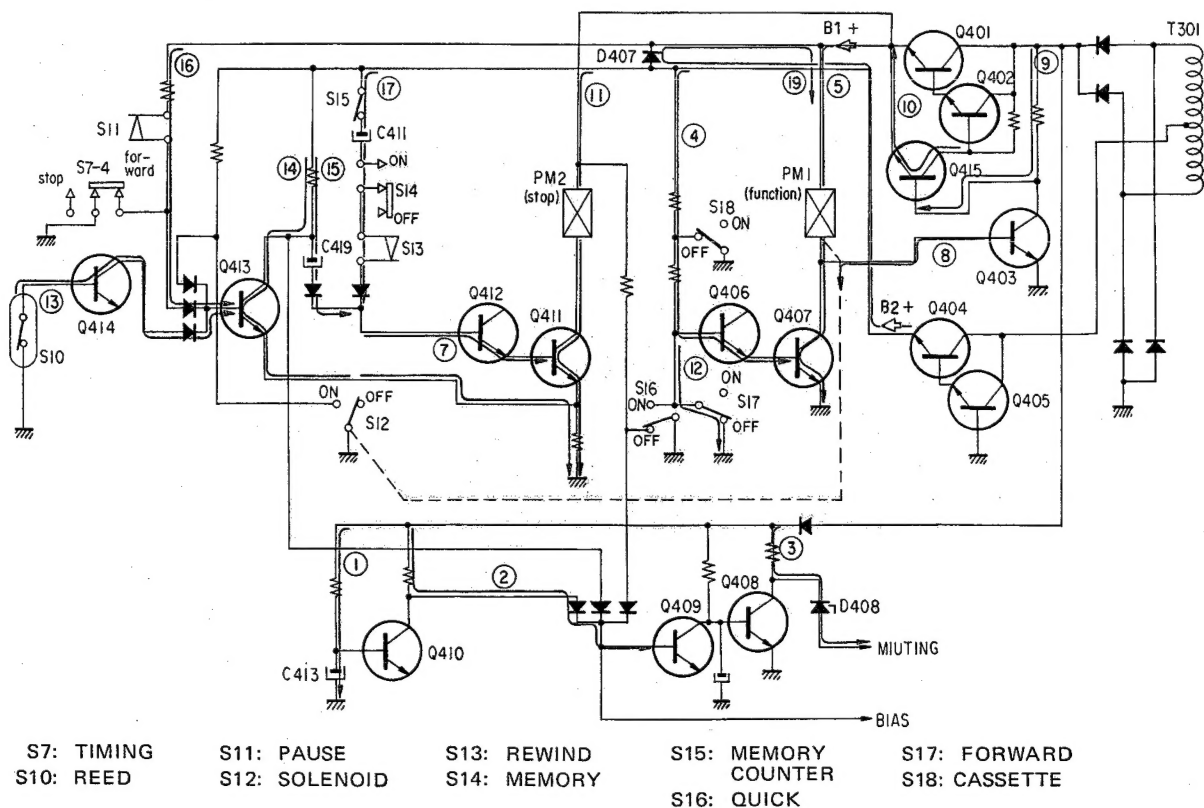
3. From PAUSE Mode to Playback, Fast Forward of Rewind Mode
(Routes ⑥, ⑦, ⑪ and ⑫):

The forward switch S17 turns ON. When the forward, rewind or fast forward button is depressed, the quick switch S16 and forward switch S17 are momentarily turns ON. The function solenoid PM1 turns OFF once and then turns ON. In this condition, the plunger switch S12 turns ON.

4. Auto Shut-off
(Routes ⑬, ⑭, ⑮, ⑦ and ⑪):

The automatic shut-off function utilizes a rotating magnet ring, reed switch, d-c amplifier and a solenoid.

In playback, fast forward or rewind mode, a-c voltage is generated by the magnet ring and reed switch S10. This a-c voltage is amplified by Q414 and rectified by a diode. Due to this d-c voltage, Q413 turns ON; Q412, Q411 and the stop solenoid PM2 turn OFF. When the a-c voltage does not generate at the magnet ring and reed switch combination, Q413 turns OFF, Q412 and Q411 turn ON. Accordingly the stop solenoid PM2 also turns ON and shuts the mechanism OFF.



5. Playback and PAUSE Modes
(Routes ⑩ and ⑭):

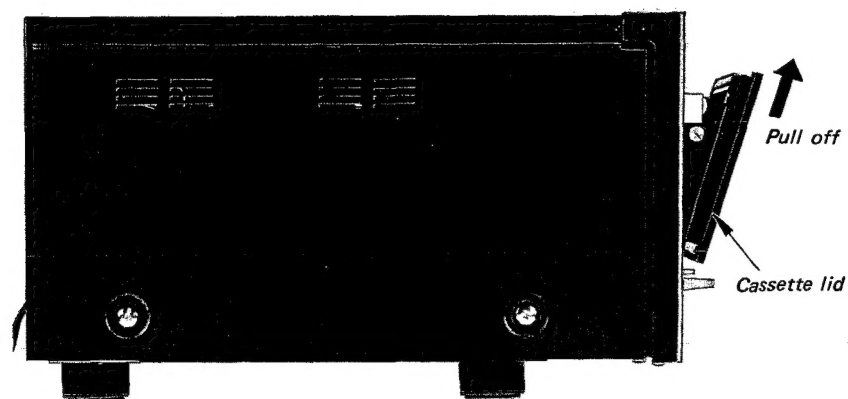
In these modes, the pause switch S11 turns ON or the timing switch S7-4 turns to forward position. In this condition, Q413 turns always ON and Q412 and Q411 turn OFF. When the magnet ring stops rotating, the stop solenoid is in OFF condition and thus the shut-off mechanism does not operate.

6. Rewind Mode and MEMORY COUNTER
(Routes ⑰, ⑦ and ⑪):

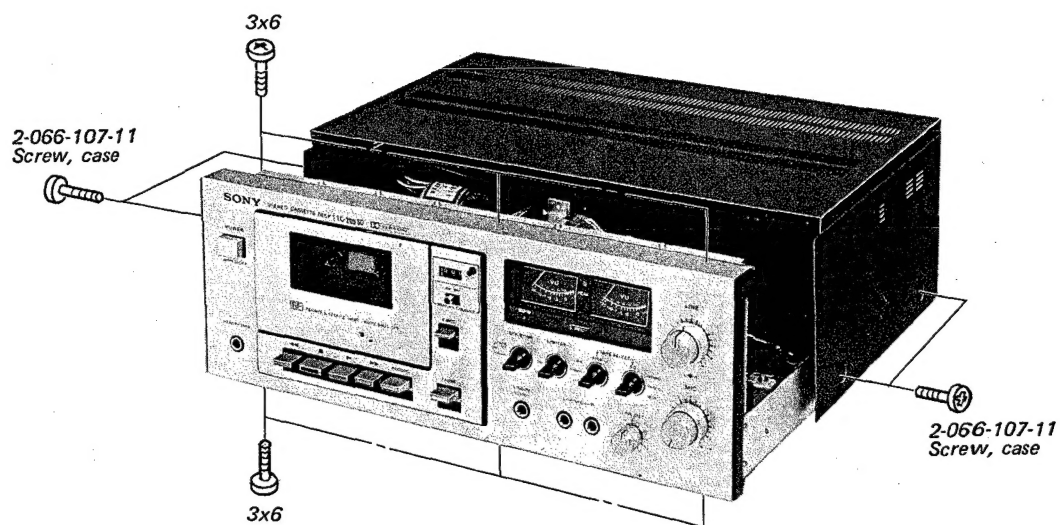
When COUNTER MEMORY switch S14 is turned to ON position in the rewind mode (rewind switch S13 turns ON), the counter switch S15 (built in the tape counter) turns ON at the count of 999. In this condition C411 charges up and Q412 and Q411 turn ON. Thus the stop solenoid PM2 turns ON and the shut-off mechanism operates.

SECTION 2 DISASSEMBLY

2-1. CASSETTE LID REMOVAL



2-2. FRONT PANEL REMOVAL



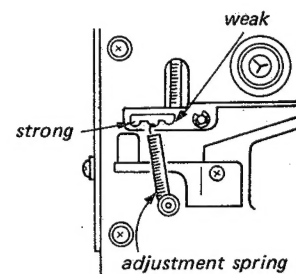
SECTION 3 ADJUSTMENTS

3-1. MECHANICAL ADJUSTMENTS

Forward Back Tension Torque Adjustment

— Playback Mode —

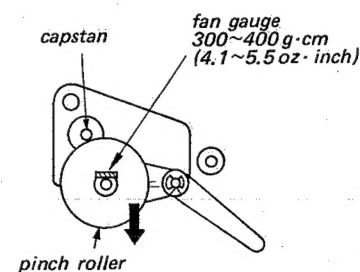
Adjust by changing spring hook position to obtain the torque of 2~4 g·cm (0.03~0.05 oz·inch).



Pinch Roller Pressure Measurement

— Playback Mode —

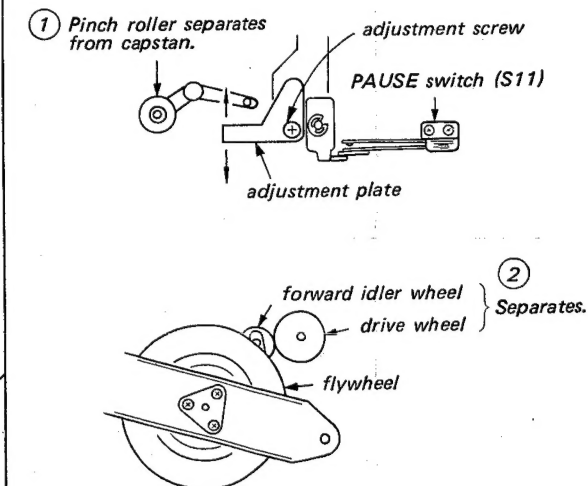
Note: Separate the pinch roller away from the capstan. Slowly return the pinch roller and measure the pressure just when the pinch roller contacts the capstan.



PAUSE Switch (S11) Timing Adjustment

— PAUSE Mode —

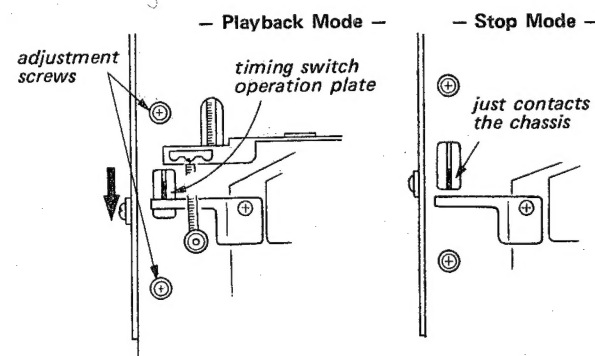
Loosen the adjustment screw and adjust the position of the adjustment plate so that step ① and ② occur in this order or at the same time.



Timing Switch (S7) Position Adjustment

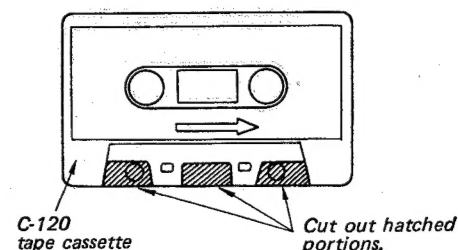
— Playback and Stop Modes —

In playback mode, loosen the adjustment screws and fully push the timing switch operation plate in the arrowed direction. Tighten the screws and confirm that the timing switch operation plate places as illustrated while operating the set in playback and stop modes alternately.

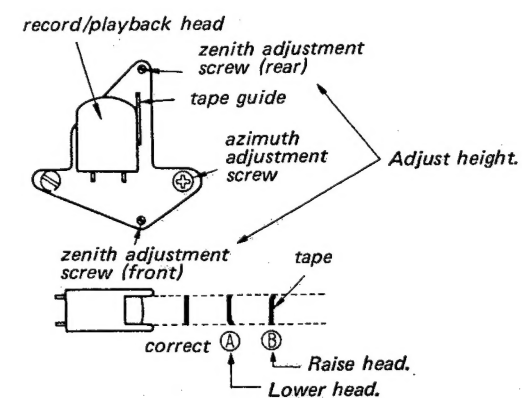


Head Height Adjustment

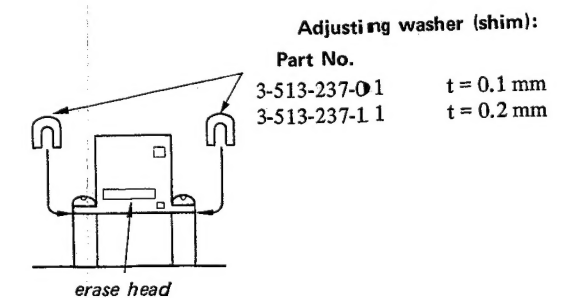
1. Make an adjustment cassette as shown below.



2. Adjust the zenith adjustment screws to eliminate any tape curls at the tape guide of the record/playback head while slowly depressing the forward button. After this adjustment, perform the record/playback head adjustment.



3. If any tape curl exist at the erase head, eliminate the curl by adjusting the height of the erase head using adjustment washer (shim) with the adjustment tape cassette loaded.



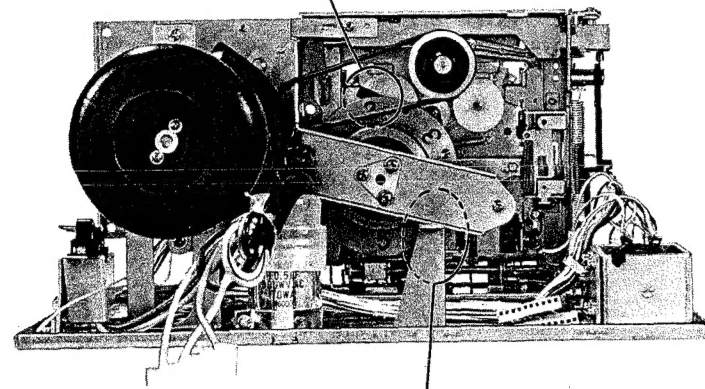
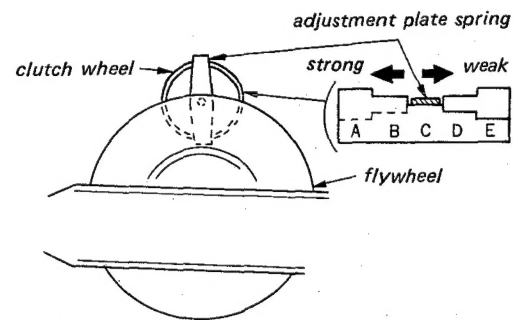
Adjusting washer (shim):
Part No.
3-513-237-01 t = 0.1 mm
3-513-237-11 t = 0.2 mm

Forward Torque Adjustment

— Playback Mode —

Adjust torque by changing the position of the plate spring on the clutch wheel.

Forward torque: 40~60 g.cm
(0.55~0.83 oz.-inch)

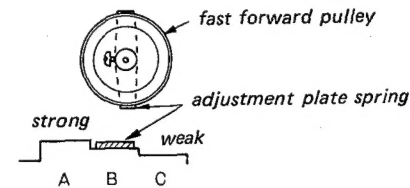


Fast Forward Torque and Rewind Torque Adjustments

— Fast Forward or Rewind Modes —

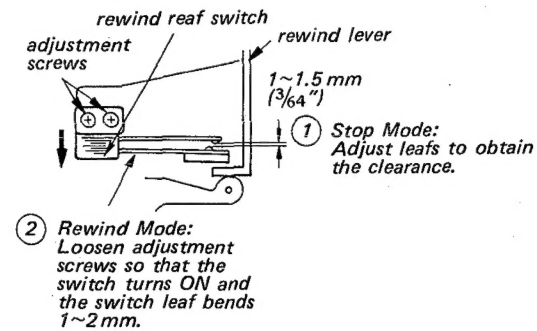
Adjust torque by changing the position of plate spring to obtain the specified torque.

Fast forward and rewind torque:
80~120 g.cm
(1.1~1.6 oz.-inch)



Rewind Leaf Switch (S13) Position Adjustment

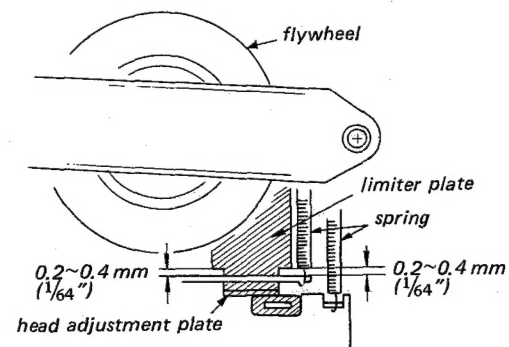
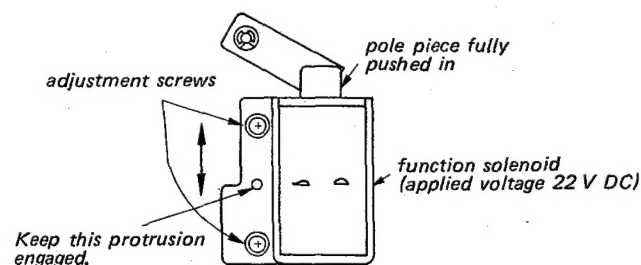
— Rewind and Stop Modes —



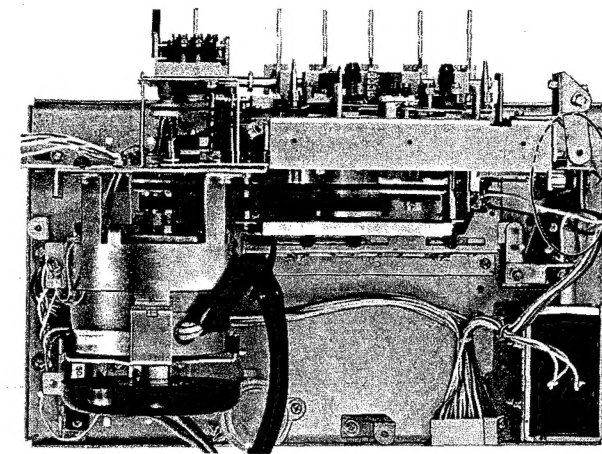
Forward Limiter Adjustment

— Stop and Playback Modes —

In stop mode, loosen adjustment screws and adjust the position of the function solenoid to obtain the specified clearance between the limiter plate and head adjustment plate.

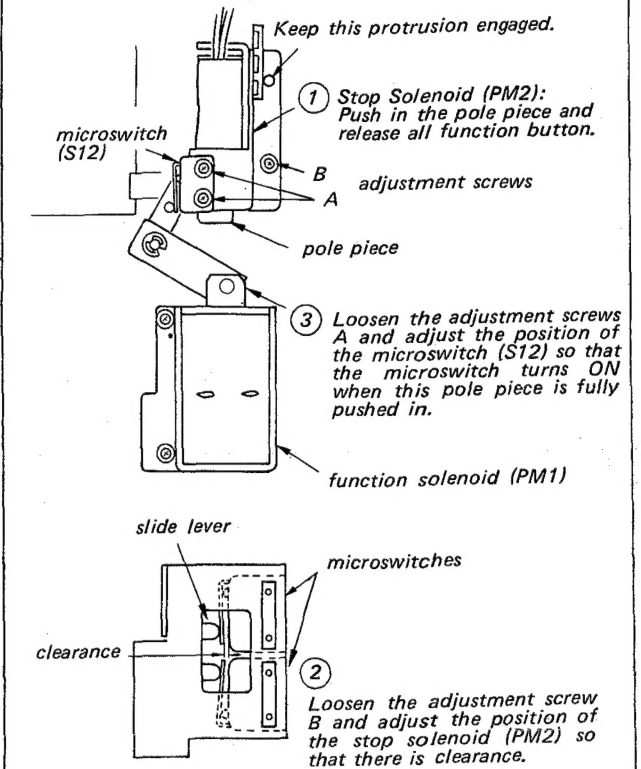


After adjustment, confirm the clearance by changing modes playback and stop alternately.
After adjustment, secure the adjustment screws.



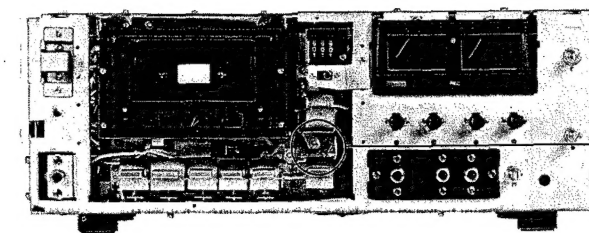
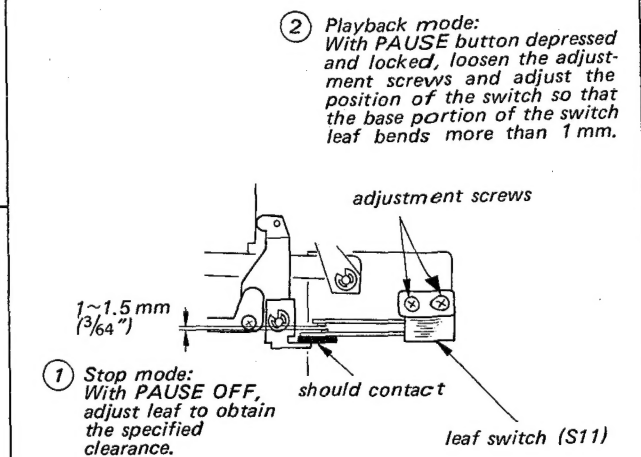
Stop Solenoid (PM2) Position Adjustment

— Playback Mode —



PAUSE Leaf Switch (S11) Position Adjustment

— Stop and Playback Modes —



3-2. ELECTRICAL ADJUSTMENTS AND MEASUREMENTS

PRECAUTION

1. Clean the following parts with an alcohol moistened swab:

* record/playback head	* pinch roller
* erase head	* rubber belts
* capstan	* idlers
2. Demagnetize record/playback head with a head demagnetizer.
3. Do not use magnetized screwdriver for adjustments.
4. After the adjustments, apply a small amount of a locking compound to the parts adjusted.
5. The adjustments should be performed in the order arranged in this service manual.
6. The adjustments and the measurements should be performed for both L-CH and R-CH with rated power supply voltage unless otherwise specified.
7. The record and playback level adjustments should be carefully performed.
8. Tapes required:
 - 1) blank tapes (completely erased with bulk eraser)
 - SONY CS-10 (HF)
 - CS-20 (CrO₂) with two extra holes
 - CS-30 (Fe-Cr)
 - 2) test tapes
 - SONY P-4-A81 (6.3 kHz, -10 dB)
 - P-4-L81 (333 Hz, 0 dB)
 - WS-48 (3 kHz, 0 dB)
9. The switches and the controls should be set as follows unless otherwise specified.

DOLBY NR switch:	OFF
LIMITER switch:	OFF
LINE control:	MIN
MIC control:	MIN
TAPE SELECT EQ switch:	NORMAL
TAPE SELECT BIAS switch:	NORMAL
10. Standard record:

Supply the specified input signal level to the input jack and set the MIC or LINE control to obtain the specified output signal level. Set the LINE control to MIN when MIC input is used or set MIC control to MIN when LINE IN is used.

Normal Input Level

	MIC	LINE IN
source impedance	300 Ω	10 k Ω
input level	-60 dB (0.77 mV)	-10 dB (0.25 V)

Normal Output Level

	LINE OUT	HEADPHONE
load impedance	100 k Ω	8 Ω
output level	0 dB (0.775 V)	-28 dB (31 mV)

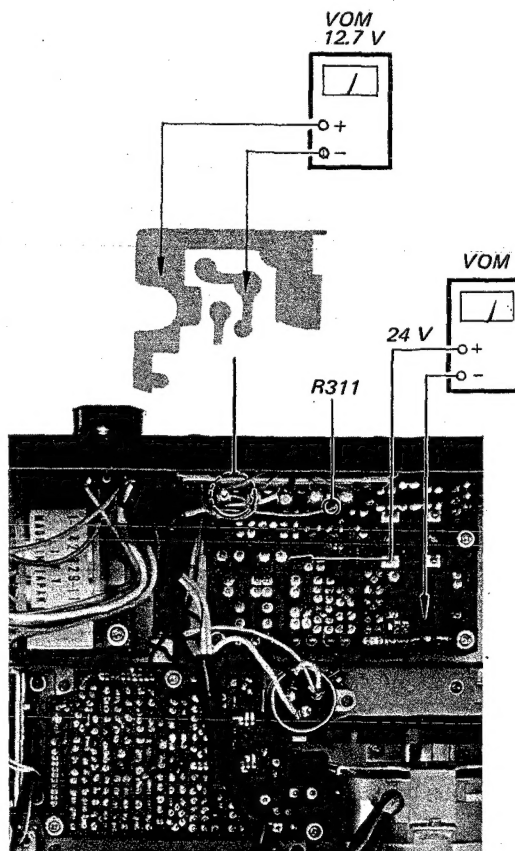
1. B+ Voltage Adjustment

Procedure:

POWER switch: ON

1. Adjust R311 to obtain 24V VOM reading.
2. Check for -12.7 V (-13.5 ~ -11.5 V).

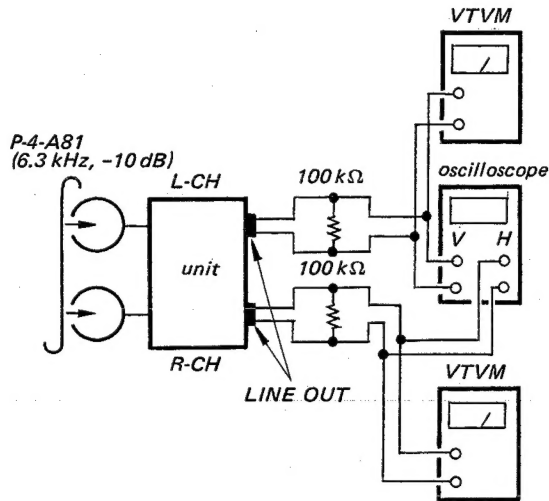
Adjustment Location:



2. Record/Playback Head Azimuth Adjustment

Procedure:

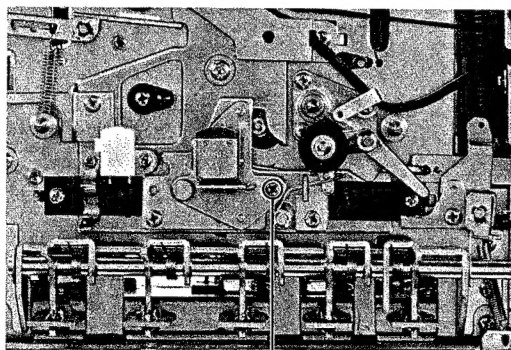
1. Mode: Playback



Adjust	Oscilloscope patterns
azimuth adjustment screw to obtain the in-phase pattern around the highest VTVM readings.	<p>[Allowance]</p> <div style="display: flex; align-items: center;"> <div style="text-align: center;"> <p>In-phase</p> <p>(L) (R)</p> </div> <div style="margin: 0 10px;">~</div> <div style="text-align: center;"> <p>90° out-of phase</p> <p>(L) (R)</p> </div> </div> <p>Level drop should be within 0.5 dB.</p>

3. Assure that LINE OUT level difference does not change when the mode is changed from playback to stop several times.
4. After adjustment, apply locking compound to the screw.

Adjustment Location:

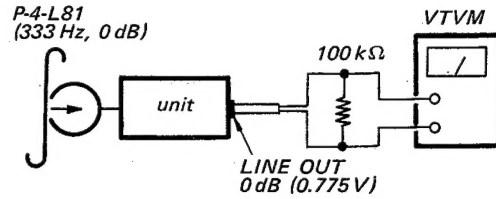


azimuth adjustment screw

3. Playback Level Adjustment

Procedure:

1. Mode: Playback



Adjust R121 (L-CH) and R221 (R-CH) to obtain 0 dB (0.775 V) VTVM reading.

2. Assure that the LINE OUT level does not change when the mode is changed from playback to stop several times.

Specification:

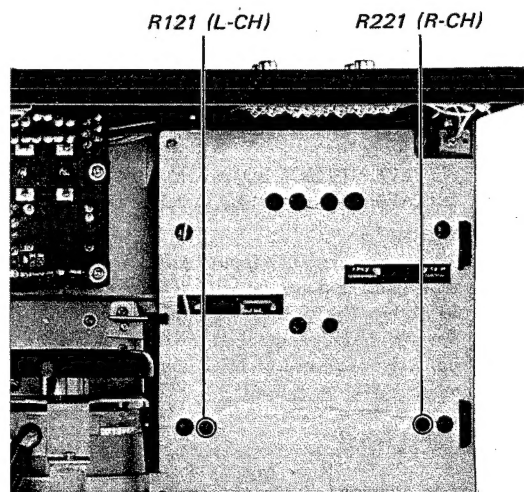
LINE OUT level: 0 dB \pm 0.5 dB
(0.73 ~ 0.81 V)

Level difference between channels: less than 0.5 dB

TAPE SELECT switch: Fe-Cr

Level difference from NORMAL should be -0.2 dB \pm 0.5 dB

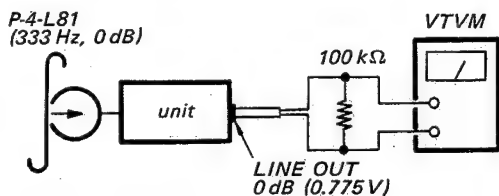
Adjustment Location:



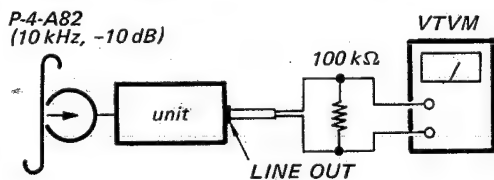
4. Playback Equalizer Adjustment

Procedure:

1. Mode: Playback



2. Mode: Playback



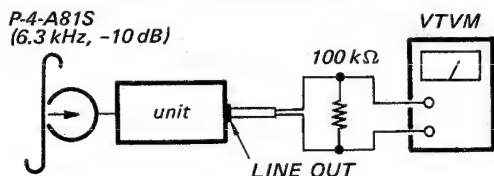
- 1) Adjust R118 (L-CH) and R218 (R-CH) to obtain the LINE OUT voltage 10.5 dB lower than that obtained in step 1 above.

Specification: 10~11 dB lower

- 2) TAPE SELECT EQ switch: CrO₂, Fe-Cr
Check that the LINE OUT voltage is 13.5 ~ 15.5 dB lower than that obtained in step 1 above.

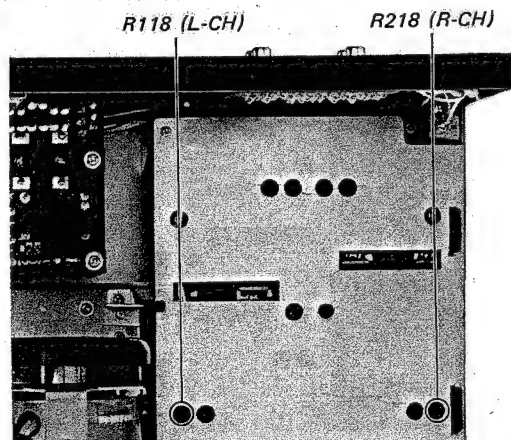
3. Mode: Playback

TAPE SELECT EQ switch: NORMAL



Check that the LINE OUT level is 9~12 dB lower than that obtained in step 1 above.

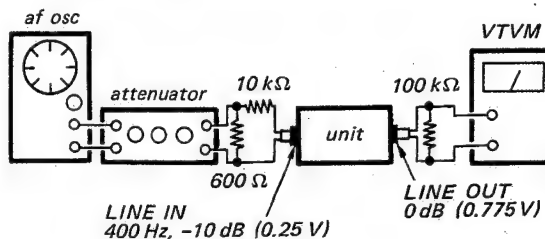
Adjustment Location:



5. VU Meter Calibration

Procedure:

1. Mode: Standard record (See page 11.)



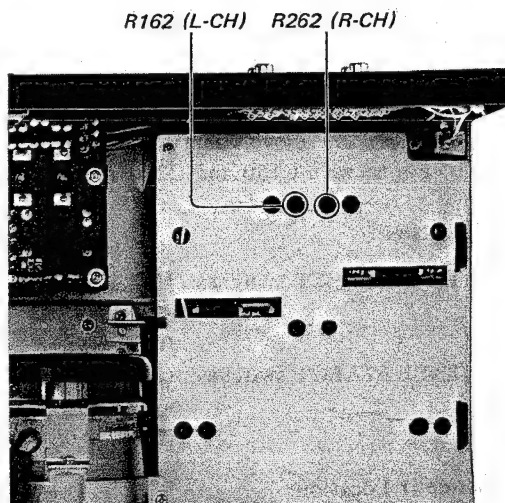
2.

Adjust	VU meter reading: 0 VU
R162 (L-CH)	
R262 (R-CH)	

Specification:

When the LINE IN level is adjusted to make 0 VU indication, VTVM reading should be -0.5~+0.5 dB (0.73~0.81 V).

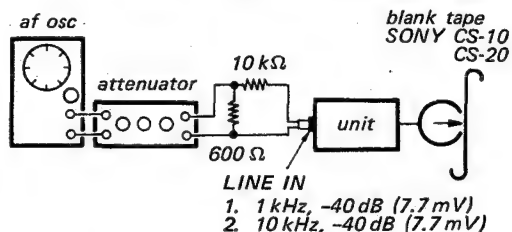
Adjustment Location:



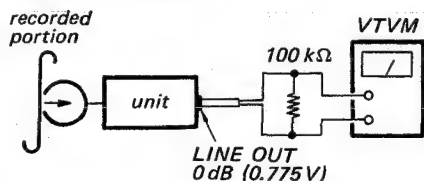
6. Record Bias Adjustment

Procedure:

1. Mode: 1) Standard record (See page 11.)
tape: CS-10
- 2) TAPE SELECT switches: CrO₂, HIGH
tape: CS-20



2. Mode: Playback



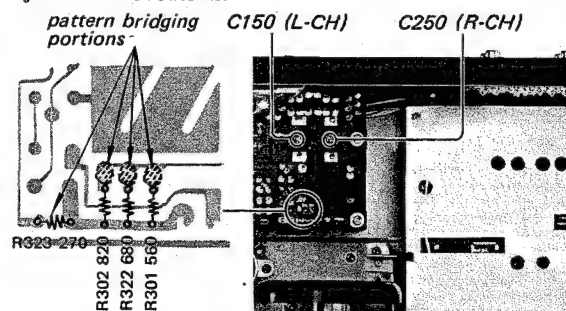
- 1) When the output levels are not the same, short R323 by bridging the patterns.
- 2) TAPE SELECT switches: CrO₂, HIGH
Adjust resistance value by selecting R301, R302 or R322 by bridging the patterns to obtain 0 dB (0.775 V) LINE OUT level. When the value of resistance is changed, step 1) is affected. Perform step 1) and 2) alternately.
- 3) When the above value is not obtained, fine adjust with C150 and C250.

Specification:

TAPE SELECT switches: NORMAL
-0.5 ~ +0.5 dB
(0.73 ~ 0.81 V)

TAPE SELECT switches: CrO₂, HIGH
-1.5 ~ +2.0 dB
(0.66 ~ 0.95 V)

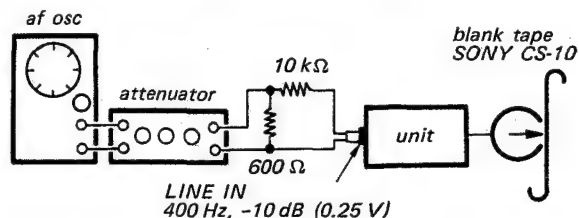
Adjustment Location:



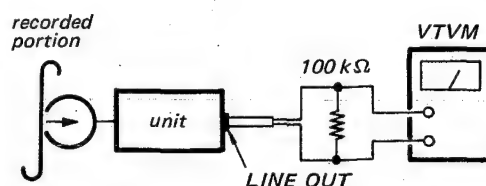
7. Record Level Adjustment

Procedure:

1. Mode: Standard record (See page 11.)



2. Mode: Playback



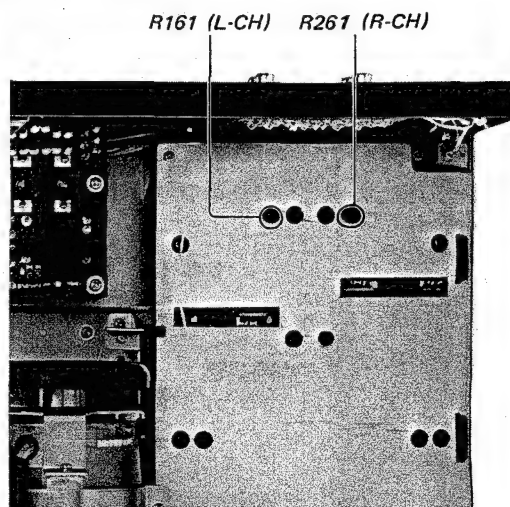
Adjust R161 (L-CH) and R261 (R-CH) to obtain 0 dB (0.775 V) VTVM reading.

3. Change the blank tape to CS-20 and CS-30, and perform the same record and playback procedure. Measure LINE OUT level.

Specification:

SONY tape	LINE OUT level
CS-10	0 dB (0.775 V, reference)
CS-20	-1.5 ~ +0.5 dB (0.66 ~ 0.81 V)
CS-30	-1.5 ~ +0.5 dB (0.66 ~ 0.81 V)

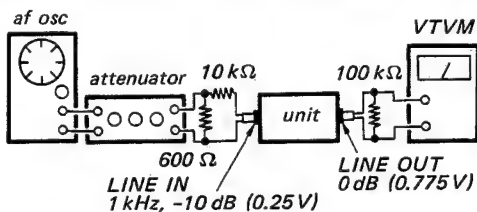
Adjustment Location:



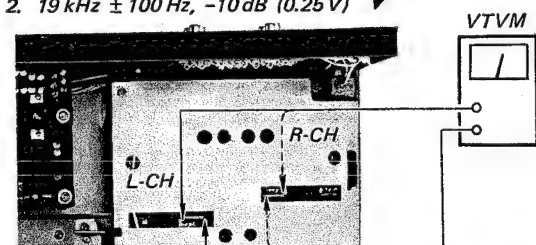
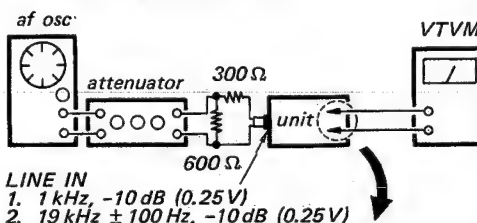
8. 19 kHz Filter Adjustment

Procedure:

1. Mode: Standard record (See page 11.)



2. Mode: Standard record
DOLBY NR switch: ON



- 1) Measure the Dolby input level with 1 kHz LINE IN signal.

Specification: $-21 \text{ dB} \pm 0.5 \text{ dB}$
(69 mV ~ 73 mV)

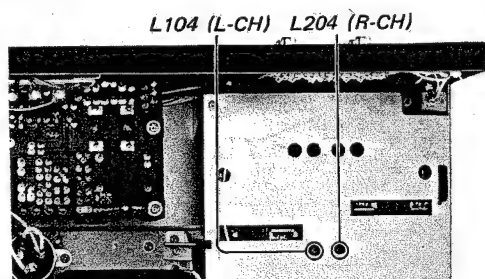
- 2) With 19 kHz signal, adjust L104 (L-CH) and L204 (R-CH) to obtain the minimum Dolby input level.

Specification: $-53 \text{ dB} \pm 4 \text{ dB}$
(1.1 mV ~ 2.7 mV)

- 3) DOLBY NR switch: ON-FILTER OFF
With 19 kHz signal, measure the Dolby input level.

Specification: $-24 \text{ dB} \pm 2 \text{ dB}$
(39 mV ~ 62 mV)

Adjustment Location:

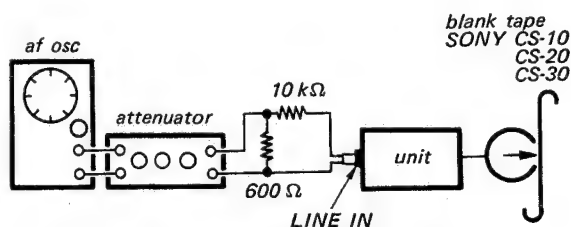


9. Overall Frequency Response Measurement

Procedure:

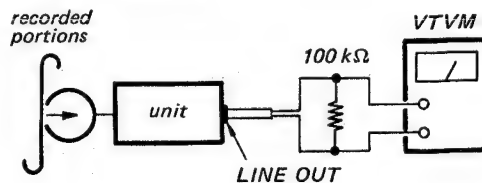
1. Mode: Standard record (See page 11.)

TAPE SELECT switch: NORMAL (for CS-10)
CrO₂ (for CS-20)
Fe-Cr (for CS-30)



1. 400 Hz, -40 dB (7.7 mV) 4. 7 kHz, -40 dB (7.7 mV)
2. 40 Hz, -40 dB (7.7 mV) 5. 10 kHz, -40 dB (7.7 mV)
3. 4 kHz, -40 dB (7.7 mV) 6. 12.5 kHz, -40 dB (7.7 mV)

2. Mode: Playback



Measure LINE OUT level difference from that of 400 Hz output level.

Tape	f	Level difference				
		40 Hz	4 kHz	7 kHz	10 kHz	12.5 kHz
CS-10		$-2 \pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	
CS-20		$-2 \pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$
CS-30		$-2 \pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$	$\pm 2 \text{ dB}$

Level difference between channels:
less than 3.0 dB

3. DOLBY NR switch: ON

In the same manner, perform steps 1 and 2 with 7 kHz and 10 kHz signals, and measure LINE OUT level difference from that of 400 Hz output level.

Tape	f	Level difference	
		7 kHz	10 kHz
CS-10		$+3.5 \text{ dB}$ -2.0 dB	$+3.5 \text{ dB}$ -2.0 dB
CS-20		$+4.0 \text{ dB}$ -2.5 dB	$+4.0 \text{ dB}$ -2.5 dB
CS-30		$+4.0 \text{ dB}$ -2.5 dB	$+4.0 \text{ dB}$ -2.5 dB

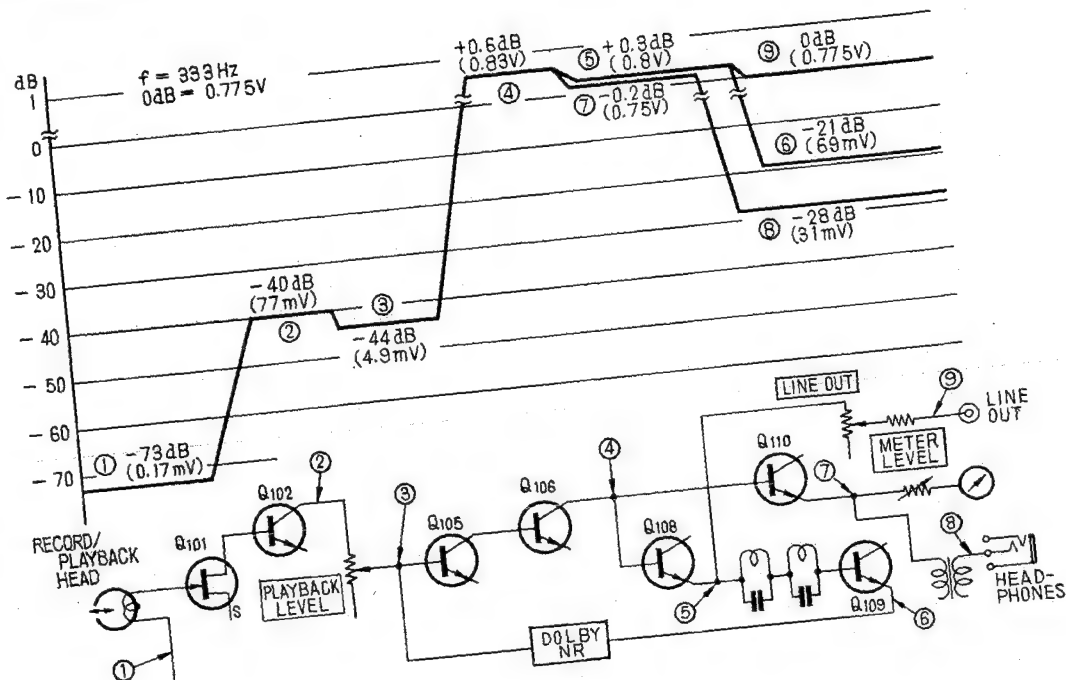
Level difference between channels:
less than 5.0 dB

4. When the above specified values are not obtained, adjust record bias slightly, and repeat the measurement.

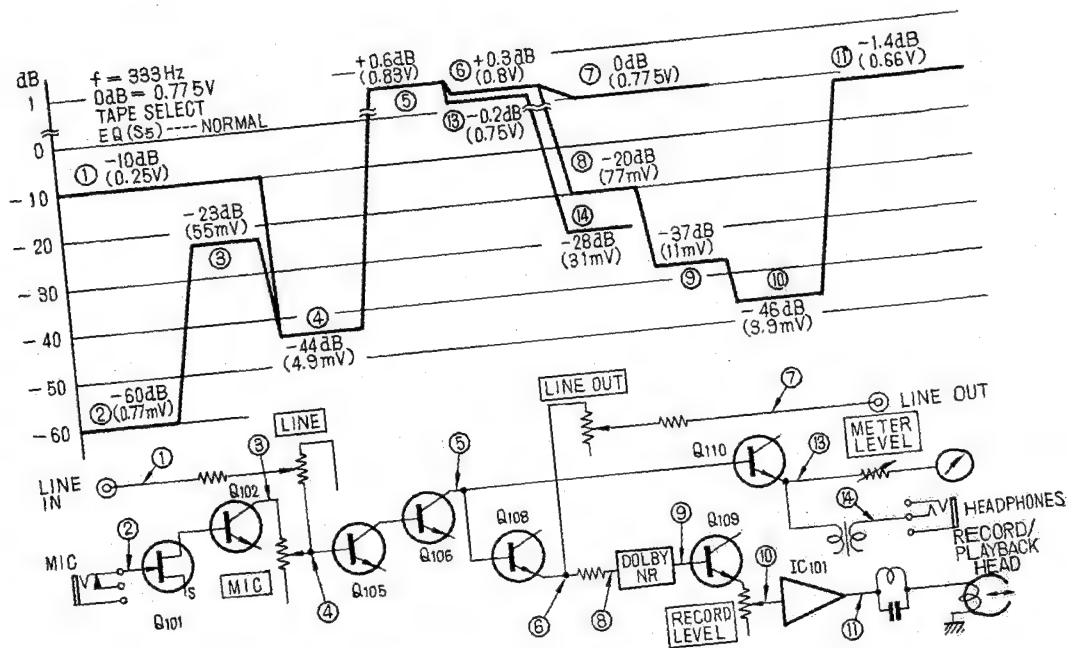
SECTION 4 DIAGRAMS

4-1. LEVEL DIAGRAM

Playback

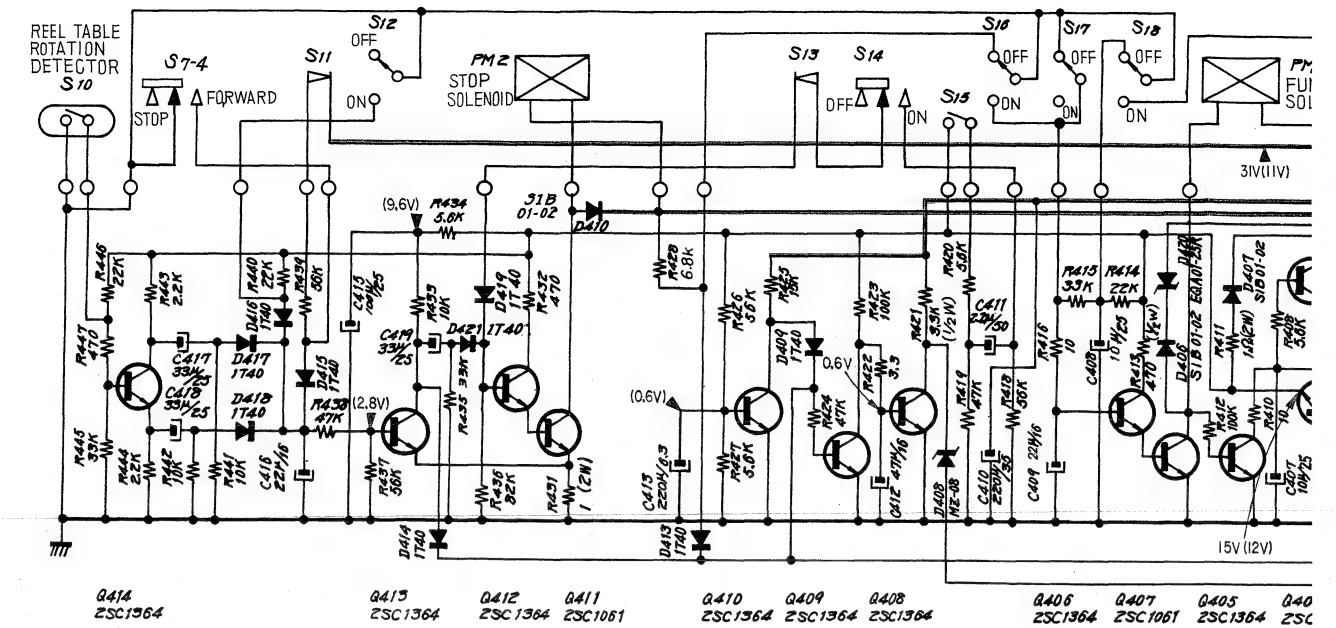


Record

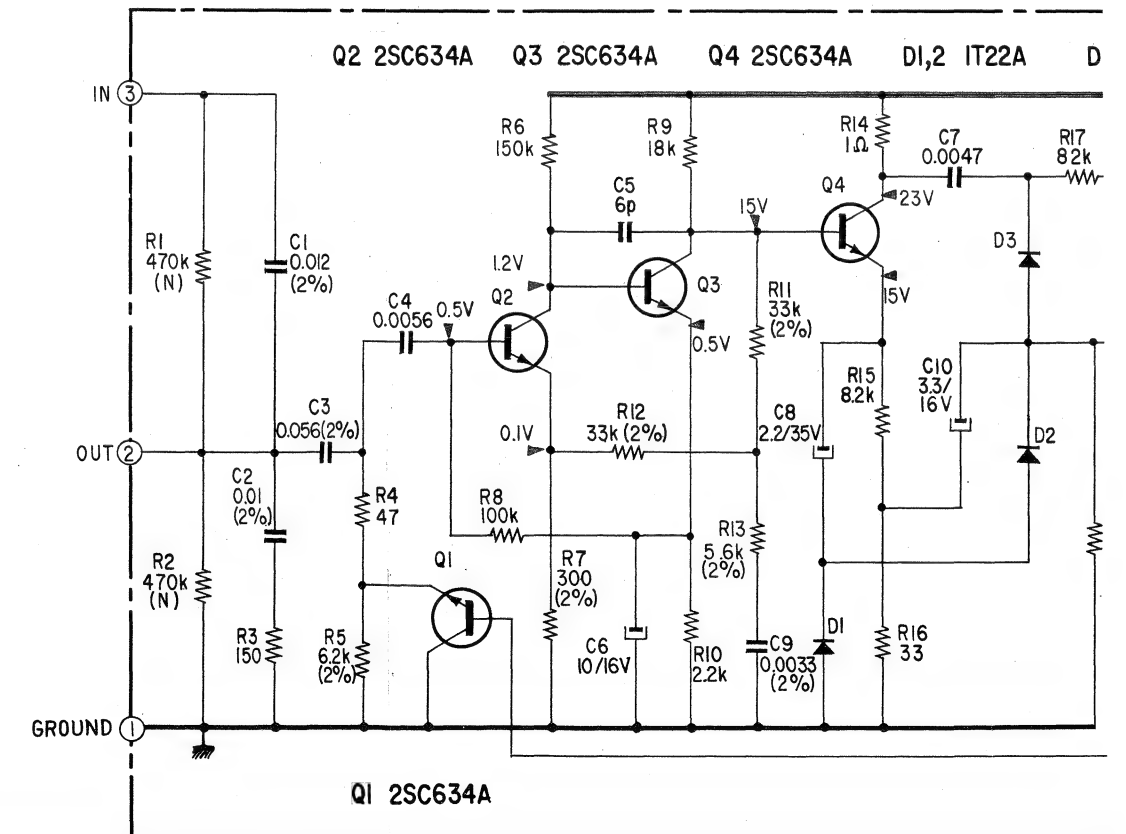


MEMO

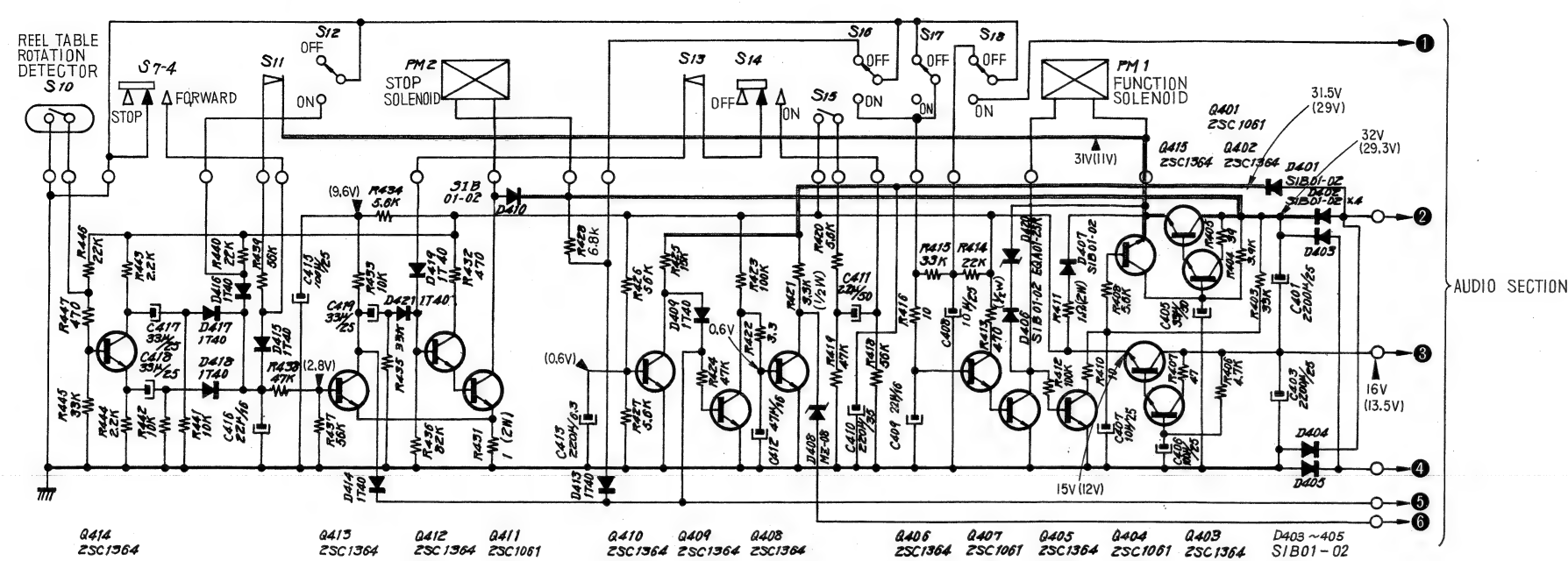
4-2. SCHEMATIC DIAGRAM – System Control –



4-3. SCHEMATIC DIAGRAM –Dolby –



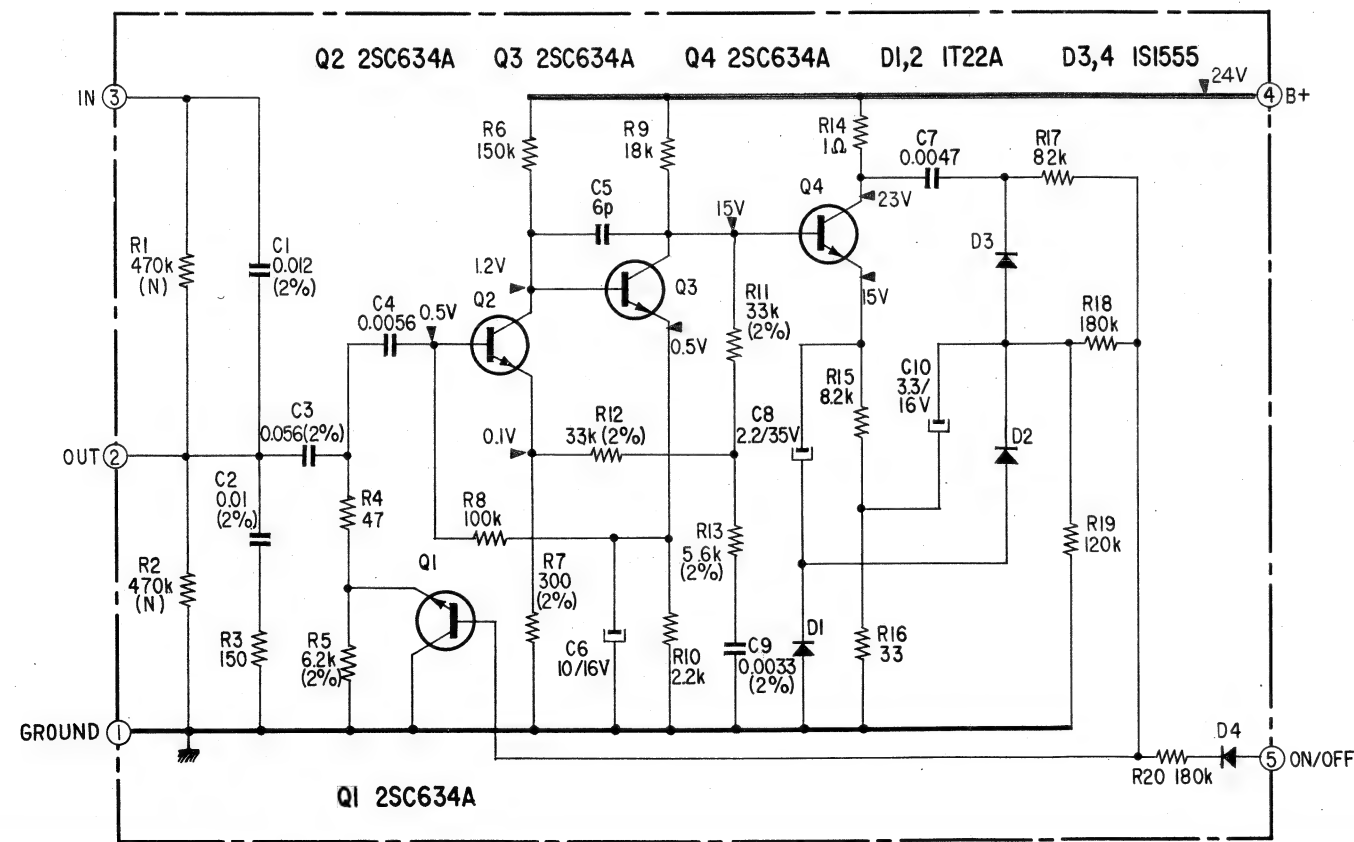
4.2. SCHEMATIC DIAGRAM – System Control –



- Note:
- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
 - All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
 - --- indicates chassis ground.
 - --- indicates B+ circuit.
 - Voltages are DC with respect to ground unless otherwise noted. Readings taken under no-signal conditions with a VOM (20 $k\Omega/V$). Readings in () are in playback mode.
 - no mark: common
 - Switch Mode:

Ref. No.	Switch	Position
S7-4	TIMING	STOP
S10	REEL TABLE ROTATION DETECTOR	OFF
S11	PAUSE	OFF
S12	SOLENOID	OFF
S13	REWIND	OFF
S14	MEMORY	OFF
S15	MEMORY COUNTER	OFF
S16	QUICK	OFF
S17	FORWARD	OFF
S18	CASSETTE	OFF

4.3. SCHEMATIC DIAGRAM –Dolby –

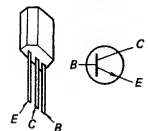


- Note:
- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
 - All resistors are in Ω , $\frac{1}{4}W$, unless otherwise noted. $k = 1,000$ $M = 1,000k$
 - --- indicates chassis ground.
 - (N) indicates a low-noise resistor.
 - --- indicates B+ circuit.
 - Voltages are DC with respect to ground unless otherwise noted. Readings taken under no-signal conditions with a VOM (20 $k\Omega/V$).

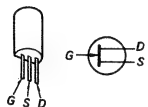
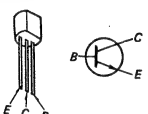
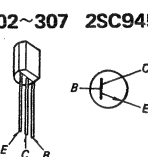
4.4. MOUNTING DIAGRAM — Audio Amp —

— Conductor Side —

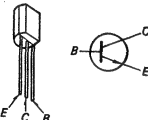
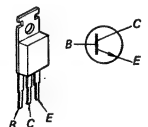
Q1~4 2SC634A

D1, 2 1T22A
D3, 4 1S1555
D103, 203 1T22D102, 202
D104, 204
D409 1T40
D413~419
D421

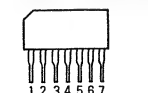
Q101, 201 2SK43

Q102, 202
Q105, 205
Q109, 209Q103, 203
Q104, 204
Q106~108
Q206~208
Q110, 210
Q402, 403
Q405, 406
Q408~410
Q412~415

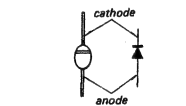
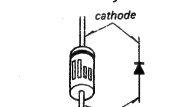
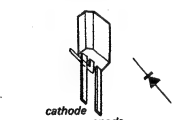
Q302~307 2SC945

Q301
Q401, 404
Q407, 411

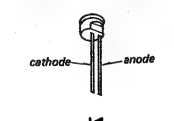
IC101, 201 TA7122AP



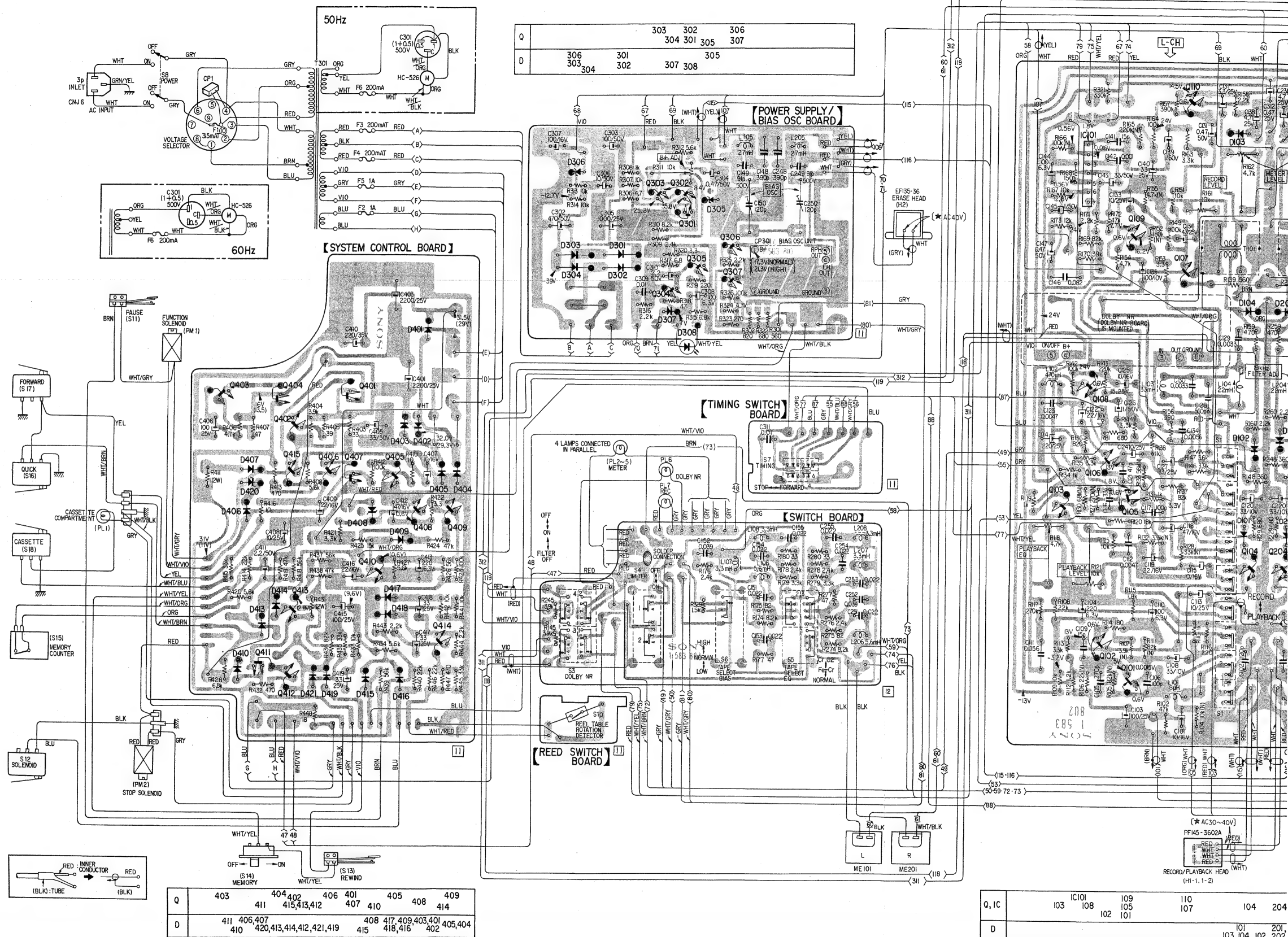
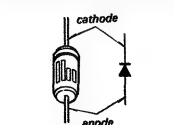
D101, 201 V06C

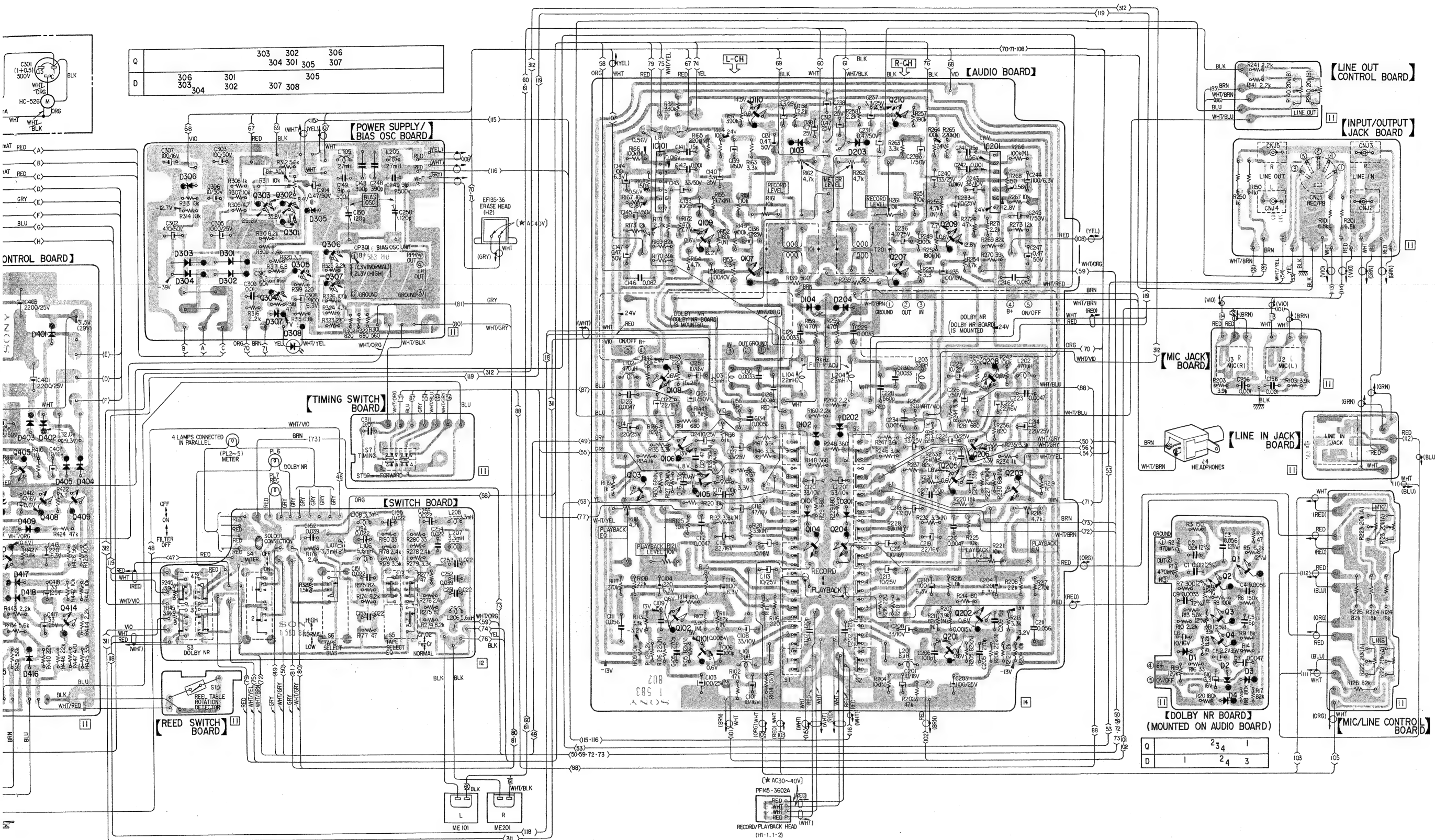
D301~304
D307
D401~407
D410D305, 408 MZ08
D306 MZ12

D308 SLP24B



D420 EQA01-25R

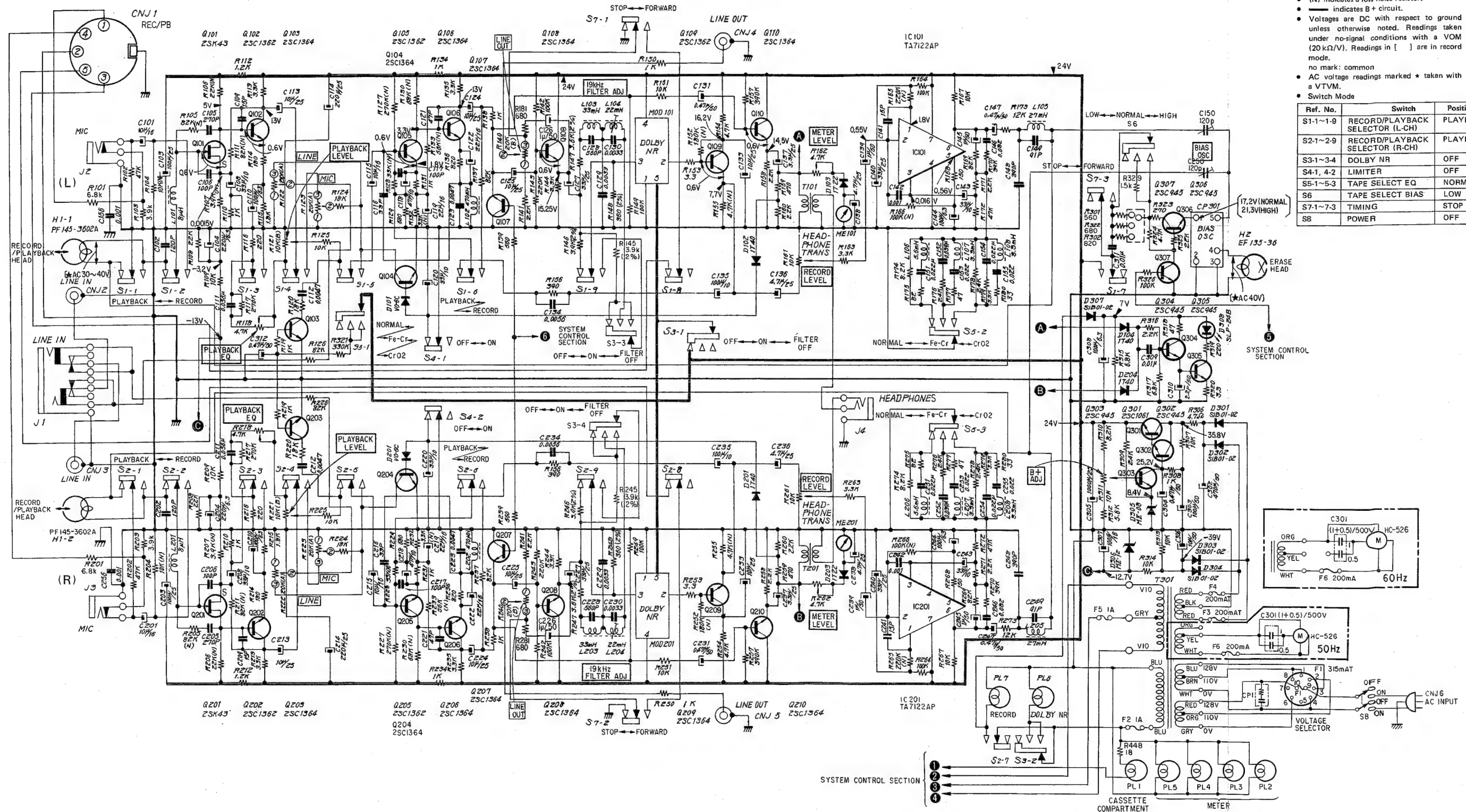




405	408	409
410	414	
408	417, 409, 403, 401	405, 404
418, 416	402	

Q, IC	103	108	109	110	104	204	210	209	206	IC201
		102	101	107			207	205	208	203
D				101	201, 204, 203			201	202	
				103, 104, 102	202					

4.5. SCHEMATIC DIAGRAM



Note:

- All capacitors are in μF unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\text{F}$
- All resistors are in Ω , $\text{k}\Omega$, $\text{M}\Omega$, unless otherwise noted. $k = 1,000$ $M = 1,000,000$
- --- indicates chassis ground.
- (N) indicates a low-noise resistor.
- --- indicates B+ circuit.
- Voltages are DC with respect to ground unless otherwise noted. Readings taken under no-signal conditions with a VOM (20k Ω /V). Readings in [] are in record mode.
- no mark: common
- AC voltage readings marked * taken with a VTVM.
- Switch Mode

Ref. No.	Switch	Position
S1-1~1-9	RECORD/PLAYBACK SELECTOR (L-CH)	PLAYBACK
S2-1~2-9	RECORD/PLAYBACK SELECTOR (R-CH)	PLAYBACK
S3-1~3-4	DOLBY NR	OFF
S4-1, 4-2	LIMITER	OFF
S5-1~5-3	TAPE SELECT EQ	NORMAL
S6	TAPE SELECT BIAS	LOW
S7-1~7-3	TIMING	STOP
S8	POWER	OFF

SECTION 5

EXPLODED VIEWS

4-839-203-00 Plate, side(L)

B 3 x 6

B 2.6 x 6

PS 3 x 6 A41

PS 2.6 x 6

PS 3 x 6

• 1 3-541-124-00 Glass, tape counter

P 2 x 4

PS 3 x 6

PS 2.6 x 5

PSW 3 x 6

B 3 x 6

Supplied with variable resistor

3-541-225-00 Escutcheon, HEADPHONE jack

4-836-125-00 Cap, lever slide switch

4-836-144-00 Knob, DOLBY NR; LIMITER; TAPE SELECT

X-3542-003-0 Knob Ass'y, LINE (R-CH)

X-4838-901-0 Knob Ass'y, LINE OUT

X-3542-002-0 Knob Ass'y, LINE (L-CH)

3-541-224-00 Glass, VU meter

4-839-201-00 Escutcheon, lever slide switch

4-839-202-00 Plate, side(R)

3-541-223-12 Panel, front

3-541-225-00 Escutcheon, HEADPHONE jack

3-536-826-00 Cover, switch

3-541-175-00 Reinforcement

X-3541-323-0 Pushbutton Ass'y, POWER

PS 3 x 6

3-541-218-00 Bracket, POWER switch

3-541-212-00 Subchassis, front

3-434-162-00 Lug

1-516-628-00 Switch, push POWER (S8)

1-516-133-00 Switch, slide; MEMORY COUNTER (S14)

3-541-165-00 Bracket, MEMORY COUNTER switch

1-507-265-00 Jack, binaural; HEADPHONES (J4)

3-533-937-00 Cushion, meter

1-520-227-00 Meter, VU (ME101, 201)

3-541-219-00 Bracket, VU meter

1-582-999-00 Printed Circuit Board, light emitting diode

PS 2.6 x 4

1-516-685-00 Switch, lever slide; LIMITER (S4)

1-516-482-00 Switch, lever slide; DOLBY NR; BIAS (S3,6)

A-2023-101-A Complete Circuit Board, switch

1-516-482-00 Switch, lever slide; EQ (S5)

1-518-115-XX Lamp, VU meter (PL2~5)

3-488-053-00 Holder, meter lamp

3-541-246-00 Case, VU meter

3-533-937-00 Cushion, meter

3-453-178-00 Grommet, lamp

3-541-226-00 Escutcheon, VU meter

3-533-306-00 Illuminator, REC lamp

Complete Circuit Board, LINE OUT control

1-224-426-00 Resistor, variable; 20 kΩ(B); LINE OUT (R140, 240)

Supplied with variable resistor

1-583-801-00 Printed Circuit Board, LINE IN

3-437-110-31 Illuminator, DOLBY NR lamp

3-541-220-00 Bracket, MIC/LINE IN jack

Supplied with variable resistor

1-224-561-00 Resistor, variable; 20 kΩ (A); LINE/MIC (R122, 222/123, 223)

A-2025-037-A Complete Circuit Board, MIC jack

1-507-479-XX Jack, phone; MIC (J2, 3)

1-507-468-00 Jack, binaural; LINE IN (J1)

A-2027-011-A Complete Circuit Board, LINE/MIC CONTROL

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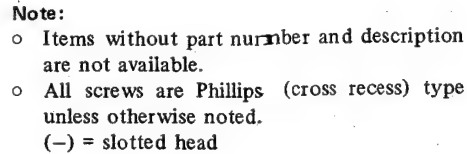
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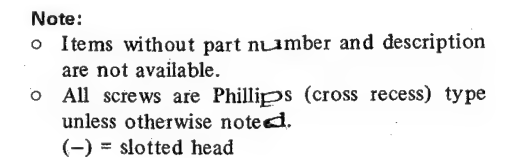
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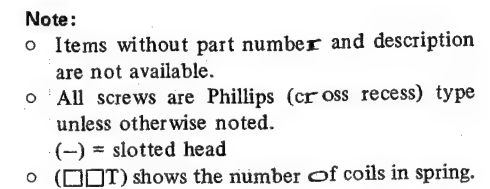
Note:

- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.

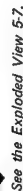
(-) = slotted head



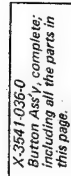




5-6.

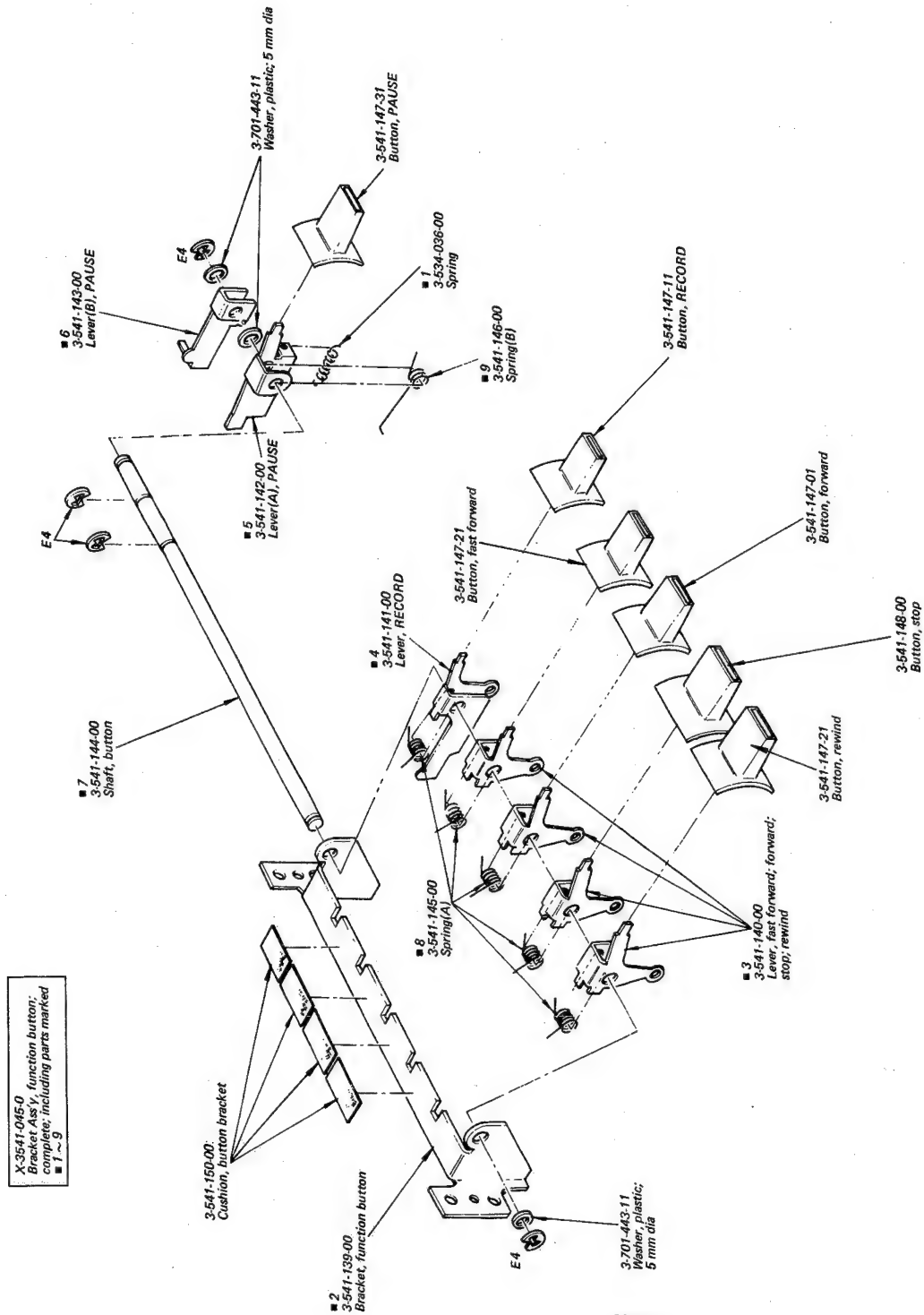


- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head
- (□□T) shows the number of coils in spring.



- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.
(-) = slotted head
- (□□T) shows the number of coils in spring.

5-7.



Note:

- Items without part number and description are not available.
- All screws are Phillips (cross recess) type unless otherwise noted.
- (—) = slotted head
- (□□T) shows the number of coils in spring.

SECTION 6

ELECTRICAL PARTS LIST

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
Complete Circuit Board			Q411	2SC1061	
			Q412~415	2SC1364	
A-2010-054-A	Audio				
A-2012-037-A	Power Supply/Bias Osc				
A-2019-043-A	System Control				ICs
A-2023-090-A	Timing Switch				
A-2023-101-A	Switch		IC101,102	TA7122AP	
A-2025-027-A	Input/Output Jack				
A-2025-037-A	MIC Jack				
A-2027-011-A	LINE/MIC Control				
A-2030-004-A	DOLBY NR				Diodes
Printed Circuit Board			D1,2	1T22A	
1-582-558-00	Record/Playback head		D3,4	1S1555	
1-582-999-00	Light Emitting Diode				
1-583-808-00	Reed Switch		D101,201	VO-6C	
1-583-801-00	LINE IN		D102,202	1T40	
			D103,203	1T22	
			D104,204	1T40	
			D301~304	SIB01-02	
			D305	MZ-08	
			D306	MZ-12	
			D307	SIB01-02	
			D308	SLP-24B	
			D401~407	SIB01-02	
			D408	MZ-08	
			D409	1T40	
			D410	SIB01-02	
			D413~419	1T40	
			D420	EQA01-25R	
			D421	1T40	
					COILS
			L101,201	1-407-519-00	8 μ H, inductor
			L102,202	1-407-661-XX	470 μ H, microinductor
			L103,203	1-407-212-XX	33 mH, microinductor
			L104,204	1-407-240-00	22 mH, variable inductor
			L105,205	1-407-211-XX	27 mH, microinductor
			L106,206	1-407-203-XX	5.6 mH, microinductor
			L107,207	1-407-200-XX	3.3 mH, microinductor
			L108,208	1-407-200-XX	3.3 mH, microinductor

Ref. No. Part No. Description

TRANSFORMERS

T101,201 1-427-284-00 Output
T301 1-442-329-00 Power

CAPACITORS

All capacitors are in μF , and electrolytic type unless otherwise noted. 50 or less working volts are omitted except for electrolytic type. $p = \mu\mu\text{F}$

C1	1-129-896-11	0.012	$\pm 2\%$	plastic
C2	1-129-701-11	0.01	$\pm 2\%$	plastic
C3	1-129-899-11	0.056	$\pm 2\%$	plastic
C4	1-105-510-12	0.0056		mylar
C5	1-102-943-11	6 p		ceramic
C6	1-121-651-11	10	16 V	
C7	1-105-669-12	0.0056		mylar
C8	1-131-205-11	2.2	25 V	tantalum
C9	1-129-794-11	0.0033	$\pm 2\%$	plastic
C10	1-131-197-11	3.3	16 V	tantalum
C101,201	1-121-651-11	10	16 V	
C102,202	1-101-340-11	120 p		ceramic
C103,203	1-121-416-11	100	25 V	
C104,204	1-121-419-11	220	6.3 V	
C105,205	1-102-984-11	270 p		ceramic
C106,206	1-102-975-11	100 p		ceramic
C108,208	1-121-402-11	33	10 V	
C109,209	1-102-956-11	15 p		ceramic
C110,210	1-121-413-11	100	6.3 V	
C111,211	1-108-813-12	0.056		mylar
C112,212	1-108-800-12	0.0047		mylar
C113,213	1-121-398-11	10	25 V	
C114,214	1-121-422-11	220	25 V	
C115,215	1-121-651-11	10	16 V	
C116,216	1-102-969-11	33 p		ceramic
C117,217	1-102-975-11	100 p		ceramic
C118,218	1-121-352-11	47	10 V	
C119,219	1-121-479-11	22	16 V	

Ref. No. Part No. Description

C120,220	1-121-402-11	33	10 V	
C121,221	1-102-881-11	47 p		ceramic
C122,222	1-121-479-11	22	16 V	
C123,223	1-108-800-12	0.0047		mylar
C124,224	1-121-398-11	10	25 V	
C125,225				
C126,226	1-121-391-11	1	50 V	
C127,227	1-121-404-11	33	25 V	
C128,228	1-102-236-11	560 p		ceramic
C129,229	1-108-798-11	0.0033		mylar
C130,230				
C131,231	1-121-726-11	0.47	50 V	
C133,233	1-121-398-11	10	25 V	
C134,234	1-108-834-12	0.0056		mylar
C135,235	1-121-414-11	100	10 V	
C136,236	1-121-395-11	4.7	25 V	
C137,237	1-121-392-11	3.3	25 V	
C138,238	1-121-395-11	4.7	25 V	
C139,239	1-121-391-11	1	50 V	
C140,240	1-121-404-11	33	25 V	
C141,241	1-102-956-11	15 p		ceramic
C142,242	1-108-825-12	0.001		mylar
C143,243	1-121-402-11	33	10 V	
C144,244	1-121-413-11	100	6.3 V	
C145,245	1-121-391-11	1	50 V	
C146,246	1-108-848-12	0.082		mylar
C147,247	1-121-726-11	0.47	50 V	
C148,248	1-102-834-11	390 p		ceramic
C149,249	1-107-168-11	91 p		silvered mica
C150,250	1-141-034-00	120 p		trimmer
C151,251	1-108-808-12	0.022		mylar
C152,252	1-108-844-12	0.039		mylar
C153,253	1-108-808-12	0.022		mylar
C154,254	1-108-808-12	0.022		mylar
C155,255	1-108-808-12	0.022		mylar
C156,256	1-101-455-11	0.001		ceramic
C301	1-117-103-11	1 + 0.5	500 V MP	
C302	1-121-810-11	470	50 V	
C303	1-121-417-11	100	50 V	
C304	1-121-726-11	0.47	50 V	

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>	
C305	1-121-657-11	1000	25 V
C306	1-121-738-11	10	50 V
C307	1-121-415-11	100	16 V
C308	1-121-413-11	100	6.3 V
C309	1-108-864-12	0.01	mylar
C310	1-121-450-11	2.2	50 V
C311	1-108-864-11	0.01	mylar
C312	1-121-726-11	0.47	50 V
C401	1-123-047-11	2200	25 V
C403	1-123-047-11	2200	25 V
C405	1-121-405-11	33	50 V
C406	1-121-416-11	100	25 V
C407,408	1-121-398-11	10	15 V
C409	1-131-201-11	22	16 V tantalum
C410	1-121-261-11	220	35 V
C411	1-121-450-11	2.2	50 V
C412	1-121-409-11	47	16 V
C413	1-121-419-11	220	6.3 V
C415	1-121-416-11	100	25 V
C416	1-121-479-11	22	16 V
C417~419	1-121-404-11	33	25 V

RESISTORS

All resistors are in ohms. ¼W regular type carbon and composition resistors are omitted. Check schematic diagram for resistance values.
k = 1000, M = 1000k

R1,2	1-242-737-09	470k	low noise
R5	1-210-853-11	6.2k	±2%
R7	1-210-850-11	300	±2%
R11,12	1-210-855-11	33k	±2%
R13	1-210-852-11	5.6k	±2%
R104,204	1-242-697-09	10k	low noise
R105,205	1-242-719-09	82k	low noise
R106,206	1-242-705-09	22k	low noise
R107,207	1-242-687-09	3.9k	low noise
R111,211	1-242-719-09	82k	low noise

R118,218	1-222-773-00	4.7k	adjustable
R121,221	1-222-774-00	10k	adjustable
R122,222 } R123,223 }	1-224-561-00	20k (A)	variable; LINE/MIC
R127,227	1-242-731-09	270k	low noise
R128,228	1-242-709-09	33k	low noise
R130,230	1-242-717-09	68k	low noise.
R132,232	1-242-685-09	3.3k	low noise
R133,233	1-242-715-09	56k	low noise
R140,240	1-224-426-00	20k (B)	variable; LINE OUT
R146,246	1-210-872-11	3.9k	±2%
R147,247	1-210-871-11	3.6k	±2%
R148,248	1-210-870-11	360	±2%
R152,252	1-242-735-09	180k	low noise
R155,255	1-242-689-09	4.7k	low noise
R161,261	1-222-774-00	10k	adjustable
R162,262	1-222-773-00	4.7k	adjustable
R165,265	1-242-729-09	220k	low noise
R166,266	1-242-721-09	100k	low noise
R331	1-222-774-00	10k	adjustable
R411,431	1-206-439-11	1	2W metal oxide

SWITCHES

S1,2	1-514-976-21	Slide, record/playback
S3	1-516-482-00	Lever Slide, DOLBY NR
S4	1-516-685-11	Lever Slide, LIMITER
S5,6	1-516-482-00	Lever Slide, EQ/BIAS
S7	1-513-273-00	Slide, timing
S8	1-516-628-00	Push, POWER
S10	1-516-590-00	Reed
S11	1-514-266-00	Leaf, PAUSE
S12	1-514-722-00	Microswitch, solenoid
S13	1-514-880-00	Leaf, rewind
S14	1-516-133-00	Slide, MEMORY COUNTER
S16~18	1-514-722-00	Microswitch; quick/forward/cassette

JACKS

CNJ1	1-509-549-00	Connector, REC/PB
CNJ2~5	1-507-433-00	Phono, 4 p; LINE IN/LINE OUT

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
CNJ6	1-509-546-00	Connector, 3 p; AC IN
J1	1-507-468-00	Binaural, LINE IN
J2,3	1-507-479-XX	Phone, MIC
J4	1-507-265-00	Binaural, HEADPHONES

FUSES

F1	1-532-235-00	315 mAT
F2	1-532-063-00	1 A
F3,4	1-532-074-00	200 mAT
F5	1-532-063-00	1 A
F6	1-532-205-00	200 mA

MISCELLANEOUS

CP1	1-231-057-00	Encapsulated Component
CP301	1-464-024-00	Unit, bias osc
H1	8-825-563-00	Head, record/playback; PF145-3602
H2	8-825-506-00	Head, erase; EF135-36
M	8-831-526-10	Motor, HC-526L

<u>Ref. No.</u>	<u>Part No.</u>	<u>Description</u>
ME101,201	1-520-227-00	Meter, VU
PL1	1-518-145-XX	Lamp, cassette holder lighting
PL2~7	1-518-115-XX	Lamp, VU meter; DOLBY NR; REC
PM1	1-454-141-00	Solenoid
PM2	1-454-123-00	Solenoid
	1-452-070-00	Ring, ferrite magnet
	1-508-693-00	Pin, terminal
	1-509-482-00	Voltage Selector
	1-533-125-00	Holder, fuse; 5 p
	1-535-506-00	Terminal, crimping
	1-536-395-00	Terminal Strip, 1L1
	1-536-396-00	Terminal Strip, 1L2
	1-548-505-00	Counter, tape

ACCESSORIES











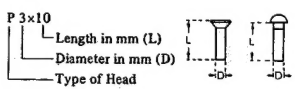
<u>Part No.</u>	<u>Description</u>
X-3701-018-2	Cleaning Tips
1-534-049-51	Cord, connection; RK-74H
1-534-819-00	Cord, power; 3-p
3-541-250-00	Sticker, loading indication
3-780-776-11	Manual, instruction
3-793-010-20	Booklet, tape talk
3-793-520-82	Card, guaranty (UK model only)
3-793-828-11	Card, caution; cassette
8-890-060-00	Tape, cassette; Fe-Cr; C-60

SECTION 7 HARDWARE

<u>Part No.</u>	<u>Description</u>	<u>Part No.</u>	<u>Description</u>
SCREWS		WASHERS	
All screws are Phillips (cross recess) type unless otherwise noted.		7-623-207-22	2.6, spring
7-621-259-15	P 2.6 x 3	7-623-210-22	4, spring
7-621-259-45	P 2.6 x 6	7-623-307-00	2.6, internal tooth
7-621-259-55	P 2.6 x 8	7-623-408-06	3, internal tooth
7-621-710-34	SC 2 x 4, hexagon socket	7-625-105-02	2 (small)
7-621-710-41	(-) SC 2 x 5	7-625-105-12	2 (middle)
7-621-759-25	PSW 2.6 x 5	7-625-107-12	2.6 (middle)
7-621-770-67	B 2.6 x 6	7-625-108-22	3 (large)
		RETAINING RINGS	
7-628-253-05	PS 2.6 x 4	7-624-102-01	E 1.5
7-628-253-15	PS 2 x 5	7-624-104-01	E 2
7-628-253-25	PS 2 x 6	7-624-106-01	E 3
7-628-253-35	PS 2 x 8	7-624-108-01	E 4
7-628-253-45	PS 2 x 10	7-624-109-01	E 5
7-628-253-55	PS 2 x 12	7-624-118-01	E 2.5
7-628-254-01	PS 2.6 x 5	NUTS	
7-628-254-15	PS 2.6 x 6	7-684-013-01	3
7-628-254-25	PS 2.6 x 8	7-684-014-01	4
7-628-254-95	PS 2.6 x 4	MISCELLANEOUS	
7-682-166-01	P 4 x 22	7-623-507-01	Lug 2.6
7-682-547-03	B 3 x 6	7-623-508-11	Lug 3
7-682-547-06	B 3 x 6	7-671-112-00	Steel Ball 2
7-682-647-01	PS 3 x 6		
7-682-649-01	PS 3 x 10		
7-682-947-01	PSW 3 x 6		
7-682-952-01	PSW 3 x 16		

*When ordering replacement parts, use PART NUMBERS listed in Parts List or shown in EXPLODED VIEWS.
Parts List reference numbers should not be used.*

- Hardware Nomenclature -

P - Pan Head Screw		SC - Set Screw	
PS - Pan Head Screw with Spring Washer		E - Retaining Ring (E Washer)	
K - Flat Countersunk Head Screw		W - Washer	
B - Binding Head Screw		SW - Spring Washer	
RK - Oval Countersunk Head Screw		LW - Lock Washer	
T - Truss Head Screw		N - Nut	
R - Round Head Screw		- Example -	
F - Flat Fillister Head Screw			

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